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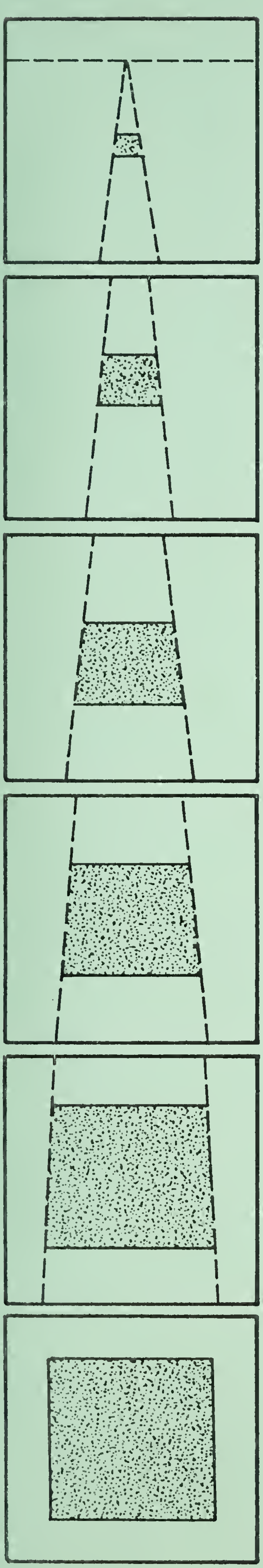

LOW VISION ABSTRACTS

VOLUME I NUMBER 1 FALL 1971

LOW VISION ABSTRACTS

Fall 1971 Vol. I No. 1

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CONTENTS

FEATURE ARTICLES

Low Vision Abstracts: An Introductory Statement. R.A. Eisenberg............1

ABSTRACTS

A General Survey of Pre-instructional Considerations for Teachers of Low-vision Mobility Clients..3

Can a colorblind subject be trained to identify colors by discriminating among the shades of grey or color which he perceives?..........4

Mobility and concept development for low vision children 5

Low Vision Evaluation........6

The Partially Sighted Child........................6

A Review of the History and Development of Low Vision Aids and the Implications of This for the Future..........7

Low Vision Training in Orientation and Mobility -- Learning about the individual..................8

COVER:

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The motif of Low Vision Abstracts is TRANSFORMATION of Orientation and Mobility and Peripatology through an increased understanding of the visual environment of the low vision person.

ABSTRACTS (continued)
The Adventitiously Blinded Adult Client..... 9

EDITORIAL...................10

SUGGESTED RESEARCH TOPICS...11

CURRENT BIBLIOGRAPHY........12

LOW VISION ABSTRACTS: AN INTRODUCTORY STATEMENT

By Contributing Editor
R.A. Eisenberg, Director
Orientation and Mobility Training
California State College, Los Angeles

The development of this new periodical, Low Vision Abstracts, is the result of its editors' awareness and concern over the problems experienced by people with Low Vision.

Low Vision is a term appearing infrequently in literature of the past. Recently, its use has been expanded but it has been applied to a population of visually handicapped persons with visual acuity ranging from near total blindness to the borderline partially sighted (20/70). Many people incorrectly refer to any person with useful residual vision as partially sighted. To clarify the population of visually handicapped to whom attention is given in the Abstracts, we define the Low Vision person as being legally blind and with some useful residual vision. This definition in itself is not complete until we can define "useful vision" satisfactoryily and that is a subjective matter yet to be tackled by professionals working with the visually handicapped. In general, useful vision would be in the area of 5/200 or better and would exclude light perception.

The behavior of the Low Vision person can be divided into two basic functioning areas; that of near vision and that of distance vision activities. Tasks related to near vision such as reading, writing, control of tools or equipment, etc., are problems which have been given substantial consideration by a variety of professionals working with visually handicapped people. However, problems of distance perception and related functioning have received little attention, especially as they relate to the practical problems of orientation and mobility by the Low Vision Person.

It is the primary objective of the Low Vision Abstracts to draw attention to this latter problem and to assist them in the study and development of solutions to them. It is hoped that the Abstracts will form a nucleus of information and will serve to foster interest and provide background to the progressive study of these problems.

Mobility Specialists have long debated the issue of using or not using blindfolds with Low Vision clients. They have likewise debated the value of teaching them techniques which were developed for the totally blind, even when the clients' visual prognosis was poor. It is apparent that these and other questions related to the present application of training for Low Vision clients need to be investigated. The success of perceptual training of near vision suggest a potential for increasing distance perception to the extent it will significantly increase the orientation and the mobility functioning of some Low Vision people. With the existence of such a possibility, investigation of that potential is a responsibility which must be accepted by concerned professionals.

It has been expressed by the editors of the Abstracts that Orientation and Mobility Specialists are the logical professionals to explore these problems. It is their hope that students in the graduate Orientation and Mobility Training Programs will select aspects of these problems for investigation through independent or directed studies, as part of their training. It is also hoped that those personnel already working with Low Vision clients will pursue the development of studies to investigate the techniques they are using or to develop, apply, and study new approaches.

It is intended that the Abstracts serve as a vehicle through which abstracts of related literature, bibliographies of potentially related information, and reports of newly developing information can be shared. You are invited and encouraged to become familiar with the present and future issues of the Low Vision Abstracts and to submit reports of pertinent studies recently completed or in planning.

Dailey, Robert H.
Peripatology Program
Boston College
1971

"A General Survey of Pre-instructional Considerations for Teachers of Low-vision Mobility Clients."

In this low vision seminar paper Mr. Dailey recommends that Orientation and Mobility Specialists avoid the restricting use of types of visual disorder as a starting point for evaluation. A more useful approach is to recognize the variety of levels of vision. The following guidelines exist with respect to acuity and visual field data:

1. Acuity of 5/200 or less denotes need for special O & M training, ability to discriminate even gross objects is impaired.

2. Light perception acuity indicates a good chance that the client will be more hindered than helped by attempts to utilize many visual stimuli; "white-out" caused by glare or strong illumination may result in confusion and frustration.

3. Acuity scores are obtained from the center of the field; scores are increasingly meaningless for O & M purposes as size of field is reduced.

4. Field restriction causes greater need for O & M training than does acuity limitation.

5. It is necessary to know more than the diameters of the client's fields; location of "island of blindness" should be noted.

6. Color discrimination ability should be determined.

Three basic areas of visual function (detection of layout of environment, detection of changes, and control of locomotion) may be reduced to more primitive levels with low vision. Discrimination ability may range from detection of brightness-contrast to the distinguishing among motions and events. The classifications outlined in this paper can be used as a general guide in evaluating visual function and in determining necessity for supplemental sensory information.

A consideration governing use of occlusion and the cane, is that the cane should represent a channel of information additional to vision, not a replacement for vision. Generally, teaching efficient use of vision is much more important than teaching cane techniques under the blindfold.

Hagan, Marie E.
Orientation & Mobility Program
University of Pittsburgh
1971

"Can a colorblind subject
be trained to identify colors by
discriminating among the shades
of grey or color which he perceive

This investigation was designed to determine the effect of color discrimination training on the ability to discriminate colors of colorblind children. The problem was investigated within the framework of randomly assigned, pre-posttest control group design.

It was hypothesized that colorblind children who receive training in descrimination of colors would not show a significant difference in identification of colors when compared to a group of colorblind children who did not receive this training. In addition, the alternate hypothesis was offered.

The experimental and control group each consisted of three subjects who were visually handicapped children from the school for the blind. The experimental subjects had ten sessions of training, working with cards representing the six primary-binary colors, and comparing them in name and degree of brightness.

Results of the investigation indicated that the null hypothesis was not supported, and the alternate was accepted. It was concluded that colorblind subjects can be trained to identify colors through associati of the brightness factor and the stimulus color.

The results of this experiment suggest that colorblind subjects can learn, through training, to associate the color or shade which they perceive with the actual stimulus color by discriminating and comparing the brightness factor involved. However, certain limitations do exist: the sample size was inadequate for a conclusive study, and the experimente was limited to high school students since this was the only group for which recent ophthalmological examinations were conducted. Also these students are all visually handicapped, and it is possible that some or all of them, through lack of visual experience, have underdeveloped normal color vision. The narrow choice of colors under consideration, and the controlled environment in which the training was conducted provide additional limitations in that color vision is not confined to six colors, isolated and with constant illumination.

Further investigation is indicated, using subjects of normal acuity, a wider range of colors and varying backgrounds of multicolors, and use of outdoor settings as well as indoor to investigate discrimination using distance and near vision.

Hill, Everett W.
Instructor
Orientation & Mobility Program
Florida State University

"Mobility and concept development for low vision children." presentation given at the Institute for Teachers of the Visually Impaired--Low Vision Utilization. conducted by the State Dept. of Ed., Ed. for Exceptional Children Sec., Aug. 5, 1971, Orlando, Fla.

Although conceptual training is normally associated with the congenitally blind child, the process of distance vision training may be expediated if the low vision child has basic spatial concepts. The Mobility Education Program at Florida State University is involved in a project similar to the low vision assessment and distance vision perceptual training described by Apple and May (1970), but with the added dimension of spatial conceptual assessment and training.

The project is now in Phase I utilizing techniques outlined by Apple and May. The first phase entails the following: 1. The development of a vision evaluation system for elementary children relevant to Orientation and Mobility. 2. Assessment of nine low vision children in this area. 3. Assessment of nine low vision children in the area of spatial concepts. Hill's (1970) 75 item performance test on Positional Terminology will be utilized.

Phase II will consist of developing individual training programs in the areas of distance vision and spatial concept based upon the results of the evaluations.

Phase III (Formal Orientation and Mobility) may occur independently or concurrently with Phase II depending upon the needs of each child.

There is no particular time limit on the phases, but a target date of December 3, 1971 has been tentatively set to complete the evaluation phase.

Turner, Ron
Peripatology Program
Boston College
1971

"Low Vision Evaluation".

This low vision seminar paper suggests possible questions which the Orientation and Mobility Sepecialist should attempt to answer when working with a low vision client. The answers may be found either initially or at the end of the O & M program. The sample twenty-five questions contained in the paper include the following:

What medications is he currently receiving?
How is he compensating for his reduced vision?
Can he detect a curb parallel, perpendicular, curved?
Can he detect white cross-walk lines at an intersection?
How does the client discriminate distance and speed of objects moving perpendicular to him?
Can he detect motion while standing? Moving?
What is the role of size in the speed of discrimination of a distant object?

Kroleski, Pat
Peripatology Program
Boston College
1971

"The Partially Sighted Child."

This is a paper prepared for a seminar on low vision by Miss Kroleski. It contains three types of reviews: 1. A general review of the literature on low vision. Works cited were those of Bateman (1962), Karnes and Wollerstein (1963), Peabody (1966), and Mehr (1971). 2. A review of Barraga's and O'Brien's developmental stages of visual discrimination and recognition and lesson plans. 3. A review of concept development kits which might be used with low vision children. Teaching Resources Corporation is one source of such kits.

Lynch, Jacqueline A.
Orientation & Mobility Program
Western Michigan University
1967

"A Review of the History and Development of Low-Vision Aids and the Implications of This for the Future."

This research project covers the history of optical aids, the time period which is roughly over 3,000 years. Most of the work actually done concerning low-vision aids has been completed within the past ten years.

The various devices that have been found to be particularly useful for reading, as well as for distance viewing are discussed and their strong points are noted. Miss Lynch's section on telescopic aids for distance use is abstracted here.

Miss Lynch states that the telescope is the only optical device that aids vision for distance regardless of the type of ocular pathology. Pocket telescopes, useful for reading bus or street signs, mentioned were a 6X penscope or 8X prismascope. A monocular telescope which slips over spectacles is recommended for sustained distance viewing.

She mentions that a 3X sport glass has an achromatic objective, and a field of approximately 13 degrees. "With each increment of telescopic magnification the field of view constricts, at first rapidly and then more gradually."

As of 1961, no American ophthalmologist had reported any notable success employing telescopic spectacles for distance use.

She refers to Fonda (1961) when listing the disadvantages of telescopic spectacles:

Restricted visual field
Apparent closeness of the object
Inability to see at distance and near simultaneously
Objectional appearance
Expense

Editors' note: There has been no notable increase in successul use of telescopics since this paper was written.

Specht, Thomas R.
Orientation & Mobility Specialist
Community Services for the Blind
Seattle, Wash.

Low Vision Training in Orientation & Mobility - - Learning about the Individual. delivered at the Institute for Teachers of Visually Impaired Students held at the Community Services for the Blind, Seattle, Wash.,Feb. 4-5, 1971.

This is a report of evaluation and training procedures used by the author while working with partially sighted children who were clients of his agency. His program was organized around the five phases of perceptual development suggested by Marianne Frostig: visual motor coordination, perceptual constancy, position in space, and spatial relationships.

In respect to evaluation of the partially sighted child, he makes the following observations; In the Visual Motor phase the child is having difficulty coordinating what he sees with what he does. This might be observed through the child's behavior with his peers. The child with problems in Figure-ground discrimination may find it difficult to concentrate on a particular object. Perceptual constancy presents difficulties to the student in functioning with things if he does not perceive them as being constant in size. The partially sighted child is going to experience difficulty in all phases of perceptual development if he has problems perceiving position in space of his own body. A person with poor Spatial Relationships would have difficulty explaining where he is in relationship to other things in his environment.

Variables such as contrast, distance, type of light source, light intensity and psycho-social factors (sleep, diet, personal problems) should be taken into consideration when evaluating a student's functional vision.

After Mr. Specht has completed evaluation of functional vision through observation of activities such as dressing, identifying persons and objects, functioning with objects in the room, he does an outdoor functional assessment. This assessment consists of approximately three trips in bright light, twilight and at night in areas unfamiliar to the student.

Actual instruction of various concepts should procede along the same line as the five phases previously described. Instructional activities included peripheral vision exercises, gross motor activities such as the Bryant Cratty system, balance exercises, cutting and pasteing, sorting, tracing, and working puzzles.

Turner, Ron
Peripatology Program
Boston College
1971

"The Adventitiously Blinded Adult Client"

Mr. Turner begins this seminar paper with the statement that the adventitiously blind partially sighted adult is easier to instruct in an orientation and mobility program than the congenitally blind child or adult. His review of literature includes Zimmerman (1965) and Glass (1970) on adjustment of the partially sighted, and descriptions of low vision training procedures at the Catholic Guild for all the Blind and the Western Pennsylvania school for Blind Children.

Functional vision evaluation is described as an ongoing process throughout the low vision client's O & M program, with the initial evaluation serving as a basis from which to plan, train, and retest. An essential instrument in low vision training is a continuous record of what the client can or cannot see and under what conditions.

Functional vision need not be good travel vision, but can become a valuable supplement to the low vision client's other sense modalities and thus aid in mobility.

The uniqueness of each client's residual vision makes it impossible to develop a lesson plan sequence which would be meaningful to O & M instructors. Traditional lesson plan approaches may be supplemented by visual evaluation techniques and questioning. Each lesson may be preceded by discussion with the client of the situation being introduced in order to stimulate visual memory.

Occlusion is a tool which simplifies the O & M instructor's work, but at high cost to the low vision client. Occlusion as means of simulating night mobility will never produce answers as to the degree of night vision a client may have nor the effect of glare. The author stresses that at no time does the instructor have the right to make a decision regarding use of the blindfold without first consulting with the client's doctor.

EDITORIAL

And here, by jove, is another periodical. I don't have time for the journals I get now. Everyone knows that Teachers of Mobility are rugged outdoor types, not slaves to the written word.

This journal seems to have one redeeming feature, it contains abstracts. I can save more time by not reading it.

Where is that table of contents? Low Vision, huh? If it's another thing about kids' reading speed and how good Dr. Fizzbloom's new glasses are for the poor downtrodden client, I will croak. So far, so good. Not a single word about reading or optical aids. Can't be too bad - - it talks about mobility. Looks like they want Mobility people to get on the ball about helping the low vision client to use his vision.

Some of these abstracts are by guys in the college programs in mobility. It says so right here. What do they know? Say, some of these are pretty good.

Now there is something I could have used when I went through the mobility program - - some topics for papers. Fantastic. And here is a list of references in low vision. By gad, I'm greatful. That's somethi else I won't have time to read. Maybe this issue will help me to get some ideas for working with Lowell Vition, the low vision client they just assigned to me.

How often does this thing come out? Once every spring and once every fall. I am amazed to see that my ole prof is a contributing editor. That must mean that he will write one of those weighty feature articles. Come to think of it, he keeps talking about low vision, but I never have seen him write anything.

It says here, they would be glad to review an article from mobility personnel. If they print or abstract it, that puts you on the permanent mailing list. Sounds snobish as hell, but interesting.

I sure hate to have something else I should read. What a break that Low Vision Abstracts packs so much information into a few pages. I am glad I wrote for the single free copy.

Signed,

RICHARD E. KANE

SUGGESTED RESEARCH TOPICS

1. Survey the types of vision reduction equipment being employed by universities and centers for training mobility personnel under conditions of simulated low vision. Use a questionnaire to determine: a. model, b. description, c. cost, d. source, e. method of preparation, f. method of fitting, g. range of acuities and field restrictions which can be simulated, h. good and bad features.

2. Conduct a survey of types of data collection instruments being used by universities, schools, and centers for functional vision evaluation of low vision clients. Construct a model data collecting instrument incorporating the best features of the instruments surveyed.

3. Develop a scale based on your observations to measure the safety, efficiency and ease with which low vision clients negotiate curbs. Some of the variables are: distance at which tentative identification is made; distance at which final decision is made; speed and manner of approach; use of cane; use of head scan; method of stepping down, of up; and visual characteristics of walking surface.

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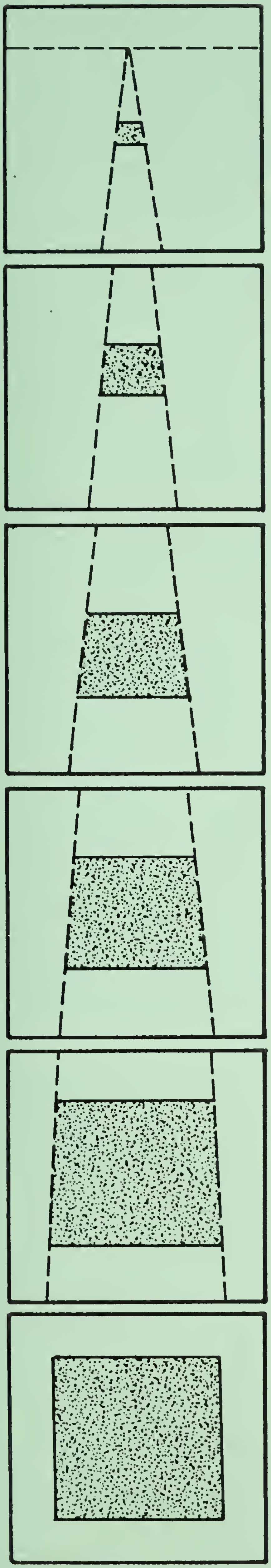

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CONTENTS

FEATURE ARTICLES

An Approach to Low Vision Research
Bruce Blasch............. 1

Disaster or Not? Telescopics For Distance Vision in Mobility.
Terry Davidson........... 3

ABSTRACTS

The Low Vision Client in Relation to Orientation and Mobility................ 9

The Role of Experience in the Visually Handicapped's Visual Perceptual Ability...10

Low Vision Evaluation Pilot Study.................11

Review of Recent Literature on Low Vision...............13

Object Identification Through Use of Low Vision...14

EDITORIAL.....................15

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The illustration is of successive transformations of the image of a square of pavement while a person is walking along a street. It was sketched from a figure given by J.J. Gibson in _The Perception of the Visual World._ "A transformation is a regular and lawful event which leaves certain properties of the pattern invariant."

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SUGGESTED RESEARCH TOPICS...16

CURRENT BIBLIOGRAPHY........17

SIMULATION: AN APPROACH TO LOW VISION RESEARCH

By Bruce Blasch
Orientation & Mobility Program
University of Pittsburg

Since 1964 a great deal of emphasis has been placed on research and training for individuals with low vision. The particular thrust of this work has dealt primarily with near vision (Barraga, 1964). However, this interest and concern is also being directed to distance vision (Apple and Apple, 1970; Blasch and LaDuke, 1970) as evidenced by the appearance of the Low Vision Abstract.

Research dealing with the use and training of low vision has taken basically two approaches. The first approach has involved a thorough review of the literature (perception, elementary education, child development, special education) and then the formulation of a treatment, later to be tested with low vision individuals. A second approach has involved empirical observation and discussion with low vision individuals to glean possible strategies, curriculum material and training procedures. These strategies, curriculum materials and training procedures were tested utilizing low vision individuals. This is not to imply that these approaches are done independent of each other.

A third approach is the use of simulation. Simulation has been defined in the most general terms as the obtaining of the essence of something, but without all aspects of reality (Thomas and Deemer, 1957). Other definitions and descriptions of the term simulation include the following: an accurate representation of a realistic situation (Wynn, 1964); "simulation is a process that involves the participant in decision-making, often under emotional conditions that intensify his motivation (Rice, 1966); and Merriam-Webster (1969) defined a simulator as "a laboratory device that enables the operator to reproduce under test conditions phenomenon likely to occur in actual performance."

Early uses of simulation as a training device were the military, business and industry. In the past decade simulation has been used extensively in the behavioral sciences and in education. A number of experiments have involved the use of lenses and/or the amount of visual input (refer to review in Blasch and LaDuke, 1970). These experiments utilized a variety of animals as well as human subjects. The various simulated visual inputs represented such conditions as total blindness, low vision, and distorted inputs. These experiments did not establish how, or if, perceptual orientations are learned originally (especially the experiments involving human subjects wearing prisms), but they do make it understood that these orientations can be radically influenced by learning.

The system used by the author to simulate low vision has been to use lenses to reduce the visual acuity of normally sighted individuals to the following acuities: 20/200; 10/200; 5/200 and 2/200. A process of coating plano lenses has been used to simulate a fragmental field; 20° field; 10° field; central scatoma; and glaucoma. Several pilot studies (Davidson, 1970; Dyer and Smith, 1971; Whited, 1971) have been done utilizing these lenses.

From the pilot studies stated previously and from the use of the simulation lenses in various group sessions and college courses, the author feels that the simulation of low vision for certain specific experiences may prove to be of equal or greater importance than the use of a blindfold in the instructional simulation of blindness for professional training programs. This need becomes apparent when considering the percentage of the legally blind population that have some residual vision.

A benefit of simulation of low vision may also be realized in terms of experimentation. The advantages of using simulation for research are as follows: (1) it can compress or expand real time; (2) it provides the ability of experiment, test and evaluate new systems for proposed changes in advance of having to make firm commitments; (3) it makes for more economical experimentation in terms of time, money and obtaining an experimental population; and (4) it permits the replication of experiments under different conditions. Therefore, future hypotheses (in terms of visual efficiency and functioning) could possibly be tested on a simulated group prior to testing partially sighted groups. This would be of extreme value due to the difficulty in obtaining any large number of partially sighted subjects.

In summary, simulation, for instructional use, has capabilities which include problem solving and decision making opportunities under low risk condition, time compression, immediate feedback, records of performance and trainee introspection. Simulation of low vision also has capabilities as an experiment and research mechanism for such uses as evaluation and training of residual vision. The use of simulation is not suggested to be done without regard to the other approaches but rather to introduce an additional dimension.

DISASTER OR NOT?
TELESCOPICS FOR DISTANCE VISION IN MOBILITY

By Terry Davidson
Graduate Student
Orientation & Mobility Program
University of Pittsburg

INTRODUCTION

Over the past decade there has been but little mention of telescopic spectacles and, concerning their use in mobility, the comments have been generally unfavorable. Lynch (1971) states that "as of 1961, no American ophthalmologist had reported any notable success employing telescopic spectacles for distance use (p. 7)." to which the editor added a comment: "there has been no notable increase in successful use of telescopics since the paper was written (i.e. 1967)." Because of the widespread distribution of this view to those working in orientation and mobility, it was decided to investigate the use of such aids on an experimental basis and to report the results.

It was assumed that the discussions had not centered on the use of hand-held distance aids for use while the person is stationary since the beneficial use of these aids seems well documented. However, in the use of head-borne distance aids when walking there appears to be some controversy and disagreement.

TWO VIEWPOINTS

In the United States, Margach has been prominent in condemning the use of telescopic spectacles for distance use. He has spoken to this effect at the A.E.V.H. Conference (Toronto, 1968) and again at the Low Vision Conference (1970):

> In contrast with conventional spectacles, the functional properties of most ophthalmic telescopes and microscopes can be evaluated by the mobility specialist by the simple device of looking through them himself. Whatever he has to do to get the "world" in focus will be the same thing the low vision user will have to do; also, whatever he sees will certainly be no less (often much more) than the low vision client himself will see. In other words, if you want to know what kind of mobility and orientation roadblocks his low-vision aid is producing for your client, try the aid yourself. (1970, p. 25).

> A trial of the above suggestions will yield only one answer to the question of the side-effects of low vision aids on mobility and orientation - - "disaster." Here is where the old saw arose, "If you are not legally blind, use a low vision aid and you will be." The effect of ophthalmic telescopes and microscopes (especially the former) on the visual field of the user is catastrophic insofar as travel, while wearing the aids as spectacles, is concerned. If the client needs such devices for vocational or avocational purposes, some method for getting them out of the way when he wishes to travel must be found (1970, p. 25).

In contrast with this opinion, Bier has written in "The Correction of Sub-normal Vision:"

> Much perseverance and patience may be needed by both patient and practitioner until a new habit pattern is firmly established. Walking and moving about generally with telescopic spectacles requires great skill until a proper balance and perspective is acquired, so great care must initially be exercised, particularly with such tasks as walking down stairs (1960, p. 190).

In revising this book in 1970, Bier still adopts the same approach and makes the comment:

> It is still widely believed that telescopic spectacles are not to be looked upon as permanent correction but while everyone cannot wear them constantly a large number of patients can, if that is their desire.....whether telescopic lenses are for permanent or only occasional use is an entirely individual matter, because of the patient's sight, case history, age, motive, occupation, and so on, are all governing factors (1970, pp. 219-220).

In reviewing the literature concerning the use of telescopics, there appear to be some misconceptions even among the vision specialists. Margach (1968) mentions the existence of altered perception in distance and direction and Krieger (1967) implies a distortion in perceived size, viz. "objects look deceptively large and consequently nearer than they are (p.575)." (Emphasis added.) There is no evidence that telescopics distort direction and there are experimental findings (Thouless, 1968) that establish that distortion in perceived size does not occur (i.e. the object may be "twice as close" but it is not "twice as big."

Because of the conflicting viewpoints and an apparent lack of objectivity in previous evaluations of the telescopic aid, it seemed appropriate to take up Margach's invitation to look through the aid, get the "world" in focus and discover the "side-effects" through actual testing.

FIELD CONSIDERATIONS

Of course, the "old saw," If you are not legally blind, use a low vision aid and you will be," sounds a very potent argument to the person familiar with the definition of legal blindness emphasizing, as it does, the inherent field restriction of a telescopic device. There are three comments that can be made to make this particular consideration more meaningful:

1. In using this argument, there is no attempt to weigh the benefits of better distance vision (admitting some field loss) compared to the condition of poor distance vision (with a wide, perhaps normal field). It is possible that in mobility there are situations where increased distance capability will outweigh a restriction in field (e.g. street crossings, traffic lights).

2. While it is true that many of the full aperture telescopes do have a restricted field, many of these are in fact close to 20° and now there is the development of the Wide Angle Telescope. This latter innovation recently developed by Designs for Vision, Inc. (New York) has a monocular field of 40° and is currently being evaluated at the New York "Lighthouse" Mobility Section.

3. It is of interest that the "old saw" would not apply universally since in Holland the field must be restricted to 10° in order to establish blindness on the basis of field restriction.

THE EXPERIMENT

A pair of Selsi 2.5x Sports Glasses were chosen because of availability and while these glasses are heavy and of poor cosmetic appearance, it was decided that these factors were not relevant to the investigation. The binocular field was exceptionally poor (much less than 20°) but, for the purpose of the experiment, this was seen to be an advantage for if a certain competency in mobility could be attained with such a severe filed restriction, then it could be predicted that better performance would result from less stringent field restrictions.

In order to make it impossible to gather peripheral field information (particularly in the lower quadrants), the glasses were carefully fitted with shields which came sufficiently close to the face so as to restrict vision entirely through the lens.

PROCEDURE

The glasses were first utilized inside a building and approximately 1/4 hours was spent in walking through familiar rooms, opening doors and sitting on chairs. After the initial outdoor experience of 30 minutes in a quiet residential area, an hour was spent in a light business area. Because it become apparent that some guidance was needed, the following hour in a medium business area was conducted with the cooperation of an orientation and mobility specialist.

OBSERVATIONS

Some unsteady feelings were felt on first exposure to the glasses at each training session, but adjustment was rapid and the feelings never persisted. The tendency for the unsteadiness to return on descending steps was observed on some occasions.

Negotiating steps without handrails demanded the development of a technique: it was found that, after observing the leading foot on the edge of the flight, the gaze could then be shifted to the other end of the flight and walking up or down the steps was possible by looking at the last step rather than at each individual step. Developing this technique was a matter of building up confidence to walk naturally and to avoid the temptation to look constantly at the feet.

A slight side-to-side scanning of the head was employed while walking in order to provide a larger field for "side Clearance." An initially adopted "up and down" motion of the head to scan the ground immediately ahead was found to be, in the most part, unnecessary. Gradually a satisfactory and relaxing technique was developed. When making any turn, the following technique was used: after turning the body, the head was kept in a "low" position (i.e. the gaze cast near the feet), then the head was lifted slightly and, in doing so, the intended line of travel was "cleared" for obstacles. Walking in the new direction could then proceed with the head held in a comfortable natural position scanning a small area of view some distance ahead. This field of view was found to be approximately 40-50 feet away for this experimenter and no unusual difficulties were met with in having the intervening space "invisible." If a curb, irregular surface or obstacle was observed in this field of view,then it was fixated by gradually lowering the head and approaching at a reduced pace until the obstacle could be satisfactorily negotiated.

The lateral scanning of the head was particularly important to maintain during the making of turns since the narrow field made it difficult to observe potentially dangerous objects (such as a traffic light box that juts out from a pole at head height). However, in straight line walking it was found that the lateral scanning could be reduced considerably while still retaining sufficient environmental information for safe pedestrian travel.

Traffic lights were found either by noting them at a distance or, if close to them, by finding the pole and then scanning up and then out until the light was found. Primarily because of the field restriction, it was found that the orientation and mobility specialist could offer valuable advice concerning the development of more reliance on sound cues, particularly when cars are coming from behind and make a right-hand turn to cross the pedestrian's path. By using well established procedures applicable to mobility for the totally blind combined with appropriate visual scanning, it was found that traffic light crossings could soon be made with confidence.

Judging when to cross a street in which there was moving traffic and no lights, needed no special adaptation although training with a mobility specialist would be recommended in order to build confidence. The experimenter stood on the curb and observed approaching cars through the telescopic glasses and the judgement of when to cross was validated by the mobility specialist. Thouless (1968) concludes that the apparent speed of a moving object when viewed through a telescopic system, is reduced in the same ratio as the apparent distance and this offers a ready explanation of why judgements of when to cross a street safely were easy to make (i.e. the car is closer, but it is traveling more slowly).

SUMMARY

The author did in fact take Margach's advice and tried a telescopic aid. No "disaster" was experienced and from this trial there was no evidence to suggest that adaptation to the use of telescopic spectacles could not be made.

This is not to say that it is a simple matter of giving the low vision person the aid and sending him out; a planned program to allow for specialized training is recommended, preferably under the guidance of an orientation and mobility instructor working in conjunction with the vision specialist who has prescribed the aid. Bier's emphasis on the need for patience and perseverance on the part of both the client and the instructor is surely some of the best advice that could be given to a person desiring to experiment in this field.

An open mind and more experimentation are needed in the prescription, the training and the utilization of the telescopic aid for orientation and mobility.

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Orientation and Mobility Program
University of Northern Colorado
1972

"The Low Vision Client in Relation to Orientation and Mobility"

The purpose of this study was the formulation of a standardized low vision evaluation procedure for mobility. A test battery was administered to indicated visual and auditory functioning ability, and the results of these tests were correlated to an evaluation on a standardized mobility route.

The following test battery was administered: a) the Keystone Telebinocular; b) a visual field; c) the Illinois Test of Psycholinguistic Abilities; d) the Purdue Perceptual Motor Survey; and e) performance on a standardized mobility route.

Five congentially blind university students were tested whose visual acuity ranged between 20/40 and 20/800, and whose visual impairments were of several different etiologies.

The mobility evaluation was a standardized route consisting of indoor and outdoor travel. Evaluation was made in terms of a five point scale with the average of the scores given by three examiners serving as the final rating. Auditory, tactual, kinesthetic and visual modalities, as well as orientation and directionality skills and performance were considered.

Profile performance in all the test areas are diagramed for comparison. Definite indication of useful correlation among items in the test battery was observed. The controlled testing situations provided useful information indicating general potential for performance in terms of the modalities tested. It is recommended that the test battery be further researched: testing obtained over a wide range of age levels; refinement and strengthening of the test battery; and wider standardization.

Hennessey, Joseph J.
Orientation and Mobility Program
Western Michigan University
1969

"The Role of Experience on the Visually Handicapped's Visual Perceptual Ability"

Weiss, Josephine A.
Orientation and Mobility Program
Western Michigan University
1969

The general plan of this study was to present the visual stimuli of 15 slides to 20 subjects during individual sessions at a distance of both ten feet and three feet. Slides consisted of indoor and outdoor scenes containing a travel hazard ten feet away. Subjects were asked to identify as many items as possible in each of the pictures and scored for each item. Based on the assumption that experience improves performance, ten subjects who have experienced at least six months of 5/200 to 10/200 degree of visual acuity (Group B) were compared with ten subjects upon which this degree of visual impairment was simulated through the use of refractive lenses (Group A).

Using an analysis of variance, it was determined that between group scores were not significant at the .05 level. A pared t test revealed that the simulated blind subjects saw significantly more at three feet than they did at 10 feet. Consistency of individual performances was found among the blind by a positive correlation of r = .75.

The authors found that the slides failed to realistically reproduce travel situations in two respects: they removed the person from the environment in which he would find such a hazard, and they reduced the size of the objects. This seems to influence an association factor which is more detrimental to the blind subjects than to the stimulated blind subjects.

Hill, Everett W.
Instructor
Orientation and Mobility Program
Florida State University

"Low Vision Evaluation Pilot Study"

Lewis, Paul
Visual Disabilities
Florida State University

The purpose of this study is to create a more precise objective tool for evaluation of residual vision for mobility. The authors' stated objectives are:

1. Develop criteria for defining useable travel vision in individual cases.

2. Develop a practical, easily administered, comprehensive evaluation that would not include training methodology, but rather prescriptive information on which a sound training program could be based.

It is suggested that proper training with the long cane is a satisfactory method of travel for low vision persons. A detailed analysis of the technical nature of this method of travel is made. A formula is given for computing the maximum tactual perception distance for any movement of the arm-cane combination, and tables are available from which average cane length and protection distance for any person can be computed.

The following questions are proposed and the authors attempt to answer the latter two:

1. Can we assume that with proper training a person who could visually perceive equal to the distance from the eyes to the tip of a properly fitted long cane, safely travel?

2. Would training be feasible?

3. What would these distances be?

4. Considering this visual distance to be a quasi-travel aid, what would be its limitations?

Based on this pilot study (Low Vision Abstracts, 1(1), Fall 1971, p. 5) the following recommendations concerning development of an objective functional vision evaluation were made:

a. Environmental objects should be rated in a sensible hierachy with priority objects demanding the most attention.

b. Some testable hypotheses should be established to test significant differences (if any) between subjective and objective evaluations.

A set of precise guidelines for developing an evaluation routine is presently being devised. The following is the authors' outline containing primary factors, variables and considerations:

I. Object Selection

  A. Object Quality - object quality may be classified in (5) areas (all are situational)

    1. Danger - does the object have the potential for presenting danger to the subject. This classification is priority in terms of selection of perceiveable objects, e.g. descending steps, open holes, head level overhangs.

    2. Inconvenience - does the object have the potential of presenting an inconvenience to the subject? e.g. minor harm, bumping a chair, stumbling over a threshold.

    3. Navigational - is the object necessary for proper navigation in a particular situation?

    4. Informational - does the object provide an informational stimulus to the subject? This includes objects not necessary for travel along a designated route from A to B, but rather supplemental information about the environment which could be alternate in nature, e.g. alternate route indicators, information helping to tie the environment together into a more meaningful context.

    5. Esthetic - does the object provide a purely esthetic stimulus to the subject?

  B. Dimensional Variability - when developing a routine, the evaluator should rate the dimensional variability of the classified object. Within each specific category the evaluator should determine those objects possessing low visibility characteristics and rate them within classifications as to their priority.

  C. Conditional Variability

    1. Contrasts - color, color equality, blending
    2. Lighting - bright, average, dim, variable, static
    3. Distracting Environment - movement, sounds, change

  D. Distance

    1. Maximum average visual perception
    2. Environmental constraints
    3. Object movements
    4. Object intercept

The next phase of the authors' project is the evaluation procedure which will be a series of trials measuring exact distance perception of selected objects. Following the procedure will be a system for analyzing the numberical data and a system for "profiling" the clients' distance visual ability. From this analysis, a set of recommendations and implications for training can be compiled into a prescription report.

Sifferman, Eileen	"Review of Recent Literature on Low Vision"
Orientation and Mobility Program	
California State College at Los Angeles	
1972	

A review of eight articles published since December 1970 dealing with the general topic of low vision in order to update the selected bibliography on low vision compiled by Apple and Apple. Articles included reports on low vision and mobility, educational and vocational placement of low vision persons, and optical aids, with emphasis on the latter. (Refer to current bibliography section.)

Specht, Thomas R.
Orientation and Mobility Program
Western Michigan University
1969

"Object Identification Through Use of Low Vision"

The author attempted to show a relationship between residual vision (measured visual acuity) and correct visual identification of indoor physical environment. The following hypotheses were tested: 1) If there is a positive relationship between the amount of residual vision and the visual identification of the physical environment, then low vision adolescents with relatively high clinically measured visual acuity will consistently identify significantly more objects in an indoor environment than low vision adolescents with relatively low clinically measured visual acuity. 2) Low vision adolescents with the same clinically measured visual acuity will identify the same number of objects in an indoor environment.

The review of literature covers material on visual learning, clinical testing of visual acuity, and functional vision evaluation and training. The author feels that subjectivity and variable environmental conditions of existing functional vision screening instruments could be overcome by use of slide presented stimuli.

Subjects for this study were three samples of 20 (one sighted control and two congenitally legally blind groups). Subjects were screened using slides of indoor environment and asked to identify as many items as possible in each picture.

Based on statistical analysis of the data and his own observations, Mr. Specht concluded that:

1. The better an adolescent's measured visual acuity, the larger the number of objects he will see in slides of indoor objects. However, the method of screening used is reliable only 87% of the time.

2. There is a large variance of objects seen by adolescents in the same group, which indicates that the visual screening used may provide more interpretive data than visual acuity measures in Snellen terms.

3. Subjects with residual vision saw a larger number of objects in the second viewing of slides 88% of the time.

Mr. Specht observed that the slide screening process was not an adequate screening instrument for individuals below 4/200.

EDITORIAL

Hey, you! Mobility person! Did you ever wonder why you are confused about low vision clients? Did you ever wonder why acuity and fields don't seem to correlate to live performance? Want to know something? They will correlate a lot more and you will be a lot less confused if you do them yourselves.

Gad, he fainted. Somebody bring the smelling salts.

So, you would not think of trespassing the sacred portals of medical science and take your own visual measurements on your own clients. Besides that, your university never taught you such as part of your mobility training. Talk about sacred portals!

Would it be of any help for you to know that most ophthalmologists have their secretaries or nurses take acuities and fields? If a secretary can learn it, you should be able to. I don't care if you can't spell, you can learn vision measurement.

The second thing that will interest you about these ophthalmologists' secretaries is that they are in different offices. Different offices have different lighting. Are you beginning to get the point?

There is also the matter of tests used. Very few ophthalmologists, of the sort you get your visual measurements from, have special tests for low vision clients. Did you ever witness the mess of an ophthalmologist trying to use his new $800 dollar projection chart on low vision client Lowell Vition? You saw what finally happened.... "How many fingers do you see?" Field testing is just as bad....it is called confrontation. The client is supposed to look at the ophthalmologists nose while the good doctor brings his finger in toward the center from this side and that..."Tell me when you see my finger." You don't know whether he turned on the lights after the unsuccessful attempt to use the projection chart or not. Wonder why you are confused?

He looks pale, pass the smelling salts again. Now, as I was saying. The ophthalmologist who measures one or two such clients per year isn't about to go to the trouble to buy a Feinbloom Low Vision Test Chart, or Sloan Near Vision Reading cards. But, you are, aren't you? And you are going to find out how to do fields, too.

The first thing you should do is sit down and write a nasty letter to your university, asking why this stuff was not included in the curriculum. The second thing to do is read chapters 6 and 11 from The Ophthalmic Assistant by Stein and Slatt, and chapter 7 from The Low Vision Patient by Faye.

The next thing you want to do is to find one or two other mobility people who are interested in this subject and an ophthalmologist or optometrist who will teach you techniques. Don't get nervous here, remember, they taught their secretaries, they should be able to teach you. You aren't putting them out of business, you need to know this so that you can make better judgements about about the performance of your client.

SUGGESTED RESEARCH TOPICS

1. Does rapid scanning of an object improve discrimination when it involves distance vision?
2. Will the use of a half blindfold improve cane skill, visual skills and awareness of other senses more rapidly and effectively than either the blindfold or no blindfold?
3. What is the effect of situation on the accuracy of identification of an object by the low vision person?

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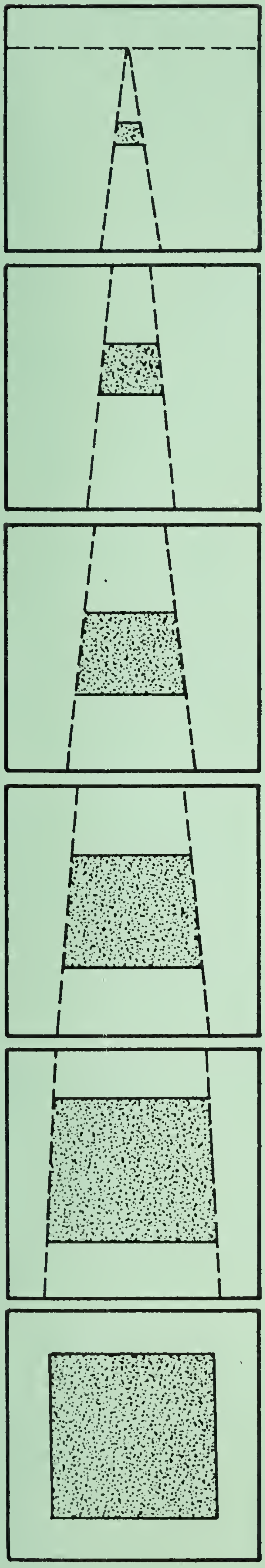

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CONTENTS

FEATURE ARTICLES

A Survey of Developments in a New Field: Orientation and mobility for the low vision person. Part I. Historical Perspective, Psychological Adjustment to Low Vision, Evaluation of Functional Vision,
Terry Davidson............ 1

ABSTRACTS

A Comparitive Study of the Effects of Sun Angle on the Distance Vision OUtdoors of Low Vision Persons with Glaucoma and Macular Degeneration................. 11

The Effects of Vision Utilization on Distance Visual Efficiency.................. 12

Medical Aspects of Eye Diseases and Its Implications on Mobility......................... 13

Increasing Visual Efficiency Through Activity............. 14

FUNCTIONAL LOW VISION EVALUATION

Proposed Sample Items for a Form Assessing Visual Efficiency.................. 15

Mobility Vision Evaluation Form........................ 19

Sample Chart for Gathering Performance Data............. 20

COVER:

The illustration is of successive transformations of the image of a square of pavement while a person is walking along a street. It was sketched from a figure given by J.J. Gibson in The Perception of the Visual World. "A transformation is a regular and lawful event which leaves certain properties of the pattern invariant."

The motif of Low Vision Abstracts is TRANSFORMATION of Orientation and Mobility and Peripatology through an increased understanding of the visual environment of the low vision person.

EDITORAL...................... 21

SUGGESTED RESEARCH TOPICS...... 23

CURRENT BIBLIOGRAPHY.......... 24

A SURVEY OF DEVELOPMENTS IN A NEW FIELD: ORIENTATION AND MOBILITY FOR THE LOW VISION PERSON*

Part I.

Historical Perspective, Psychological Adjustment to Low Vision and Evaluation of Functional Vision

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HISTORICAL PERSPECTIVE

For those who have had the experience of working at a school or agency for the (legally) blind, it will be only too obvious that mobility training is generally restricted to use of the cane. Either the person has no effective vision (e.g. totally blind or light-perception) in which case the use of a mobility tool is undisputed or, in other cases, he is considered "blind" by definition and is taught the use of the cane as a matter of policy. The latter approach has been the subject of detailed analysis in Robert Scott's book The Making of Blind Men, (1969). Very little has been provided in the way of training programs for those with "travel vision" which Fonda (1965) defines as "vision of 3/200 or better if it is assumed that the peripheral field of vision is greater than 50° in the widest diameter"; it has been virtually assumed that if a person does not need a mobility tool, be it cane or dog, then he has no problem since he can see. If he can see then no special mobility techniques are called for! The purpose of this series, is to show that this viewpoint is not only inadequate but is now, thankfully, becoming out-of-date.

In the latter half of the 1960's the articles of Froistad, Hughes, McDonald, Richterman, Silver, Stone and Zimmerman brought the issue of mobility and residual vision into prominence for the first time. Stone (1965:p.212) commented that "the problems (for those with partial sight) may be more subtel and less spectacular than those facing a totally blind person - - yet they do exist." This was agreed to by Froistad who stated that there was some evidence that the partially sighted may be more handicapped than the totally blind with respect to independent mobility. In this case, Froistad was referring to those who had a visual acuity of less than 10/200.

In introducing Stone's article, the editor of the New Outlook noted that the author was writing with the purpose of stimulating thought in an area that had had only limited treatment in the literature and, two years later, Hughes was to write that "only recently . . . . professions (in habilitation and rehabilitation) are becoming aware that some partially sighted persons also have a real problem getting from place to place with grace, ease and poise (p.119)." By 1970, sufficient interest had been generated to support a Low Vision Conference (San Francisco) and since then, the journal for Orientation and mobility specialists, Long Cane News, has included a number of articles on low vision evaluation and low vision aids. In the fall of 1971, the first issue of Low Vision Abstracts was published and it is the aim of this journal to keep those interested in low vision utilization aware of developments in this field.

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* This paper was originally written as a part of course work while Mr. Davidson was enrolled as a student in the Orientation and Mobility Program, University of Pittsburg. It will appear in serialized form in future issues of Abstracts.

As far as is known, there is at this time no facility which trains orientation and mobility specialist especially for work with low vision persons and no comprehensive written work on the subject. This series is an attempt to gather together information which may be of help to the practicing orientation and mobility specialist and it is hoped, that by placing an emphasis on what is actually being attempted, then this will prove to be of more value than the mere recapitulation of what has been written. That which has been written has often been in the most general terms and although the intentions were good there has been little of pragmatic value that the worker in the field can come to grips with and incorporate into his day-to-day instruction. This approach has been made possible by the interest of those who replied to requests for information by sending details of projects, copies of forms and publications as well as personal letters; this information was combined with already published material which may not be readily available to every orientation and mobility specialist. The coverage is not claimed to cover the work of all those who are interested and working in mobility and low vision since it results mainly from a "chain of referral" based on some initial enquiries.

PSYCHOLOGICAL ADJUSTMENT TO LOW VISION

At the Vision Rehabilitation Center at Santa Clara, California, a psychologically oriented group experience was conducted with low vision persons aged 15 to 60 years with the aim of providing an opportunity for thos people to have help in coping with their feelings related to their impairment. In reviewing the results with these groups, the authors (Mehr, Mehr and Ault, 1970) state that "there is evidence that the problems and needs of the partially sighted are different from those of either the totally blind or the sighted. There are also different types and degrees of vision impairmant which call for different social, psychological and optometric approaches. A further classification causing different psychological attitudes is the differentiation between people who have had serious vision problems from birth as compared to those who develop these visual handicaps later in life or in a sudden rather than a gradual way (p.607)."

Mehr, Mehr and Ault refer to the low vision person as a "man in limbo" while other psychologists have conceived of the concept of "overlapping situations" and the "marginal man." Two well known workers, Bauman and Yoder (1966) put their observations on adjustment to blindness in this way: "We might see this concept (of overlapping situations" as applying to the partially seeing. Sometime, overlapping situations present no problems because the behaviors expected in each are congruent. For example, blind people are regarded as well adjusted when they travel efficiently, and seeing people usually go where they wish, so the partially seeing person who is a good independent traveler reflects the desirable behavior of both groups. Sometimes the expected behavior in one situation interferes with that characteristic of the other, but not to the extent of completely disrupting the individual's attainment of his goals. If he is identified as blind because he has been unable to read a street sign and must ask a passerby what is on it, the individual may find himself forced to accept help in crossing that street --- help which he does not need and may resent, but he still gets to the other side. Unfortunately, in some overlapping situations, the expected behaviors are mutually exclusive: he must decide with which group to identify himself and give up the other (p. 48)."

Three "personality types" are suggested by Glass (1970) and these categories are sufficiently similar to Meyerson's (1971) patterns of adjustment to disability that both these author's ideas can be combined to give a more complete picture of adjustment to the specific disability of visual impairment.

(1) The individual uses the blind aspect of his identification to gain the "edge" or the advantage in his daily activities (what is here equated with Meyerson's "Withdrawal Pattern"). Glass suggests that there are social rewards and penalties that accompany this "shamming"; the rewards taking the form of praise from sighted people who see him as "an unusual blind person" while the penalties would come from people who know his true identity and visual ability.

Meyerson would say that the withdrawal pattern, although it decreases the opportunities for varied satisfactions and gratifications, should not be condemned outright as undesirable or as being a maladjusted reaction. He believes that in many cases it is appropriate and realistic for the person to shift away from the frustrating and marginal life of failure and humiliation by involving himself (or appearing to involve himself) in the "world of the blind."

(2) The individual tends to identify himself as a sighted person and attempts to "pass" as a sighted person by completely rejecting blindness even though he may not always be able to do this successfully. Meyerson sees this person as living on the barrier between two ways of life with the person attempting to escape the imputation of inferiority, and the underprivileged status by doing the same things as the"normal" and in exactly the same way as the "normal." The "normal" person tends to see this as the "best" pattern of adjustment since it does not challenge the values of the dominant "normal" majority and consequently a person who employs this pattern of adjustment is seen as having spunk and courage. Meyerson points out that the breaking of one particular barrier (say, occupational) does not necessarily mean a breakdown of all barriers.

(3) The individual attempts to learn the maximum use of his residual vision and makes a reasonable assessment of when to use the techniques of the totally blind as sensible adaptations to fulfill his needs. This is what Meyerson would call the "sharing of values of commonality" whereby the individual places the highest value on what he can do and what he has a reasonable expectation of being able to do; he does not devalue himself or the group. He does not see his impairment affecting his worth as a person and as a result his behavior is not only flexible but not bound by anxiety.

The question of the use of the white cane for either identification or protection is relevant to the discussion of psychological adjustment for the "white cane" has become a universal symbol of blindness. Mr. Kenneth Tapp, an orientation and mobility instructor at a large school for the visually handicapped writes: "Similarly, with canes we find that teenagers with fairly good travel vision do not want to use a cane. If you train them, chances are good they will not use the cane anyway after they graduate (adults are usually more willing to accept the cane). With these teenagers, however, we find that a short collapsible cane (the sort of cane held taboo by most O&M training centers) has been of some value. Some students are willing to carry such a cane in busy traffic areas. Since they may not need the cane to located objects, curbs, etc., they can simply carry it with them, in the hand closest to the parallel traffic, to identify themselves as visually handicapped to otherwise incautious drivers.....Sometimes traditional professional taboos against folding canes should be ignored and the individual client's needs and wants considered (personal correspondence)." But, as Bauman and Yoder (1966) point out: "if he wants the extra protection granted in some states by the white cane law, he must identify himself as a blind person by carrying such a cane (p.49)." (Emphasis added).

Bier touches on a similar aspect in discussing the provision of low vision aids: "many partially sighted people are very sensitive about the aesthetic factor; they would rather not use lenses giving improved vision than have attention focussed on their disability (p.33)." Such a person is not worried by the possibility of being identified as blind but rather, that he is non-normal (i.e. he has adjustment pattern #2).

In order to overcome what was overt criticism of the school's first attempts to work with low vision students, Tapp has cited the value of a strong public relations effort. "Many people are still struggling to accept the whole idea of mobility training for the blind anyway, and the problem is greatly complicated when you try to tell someone that Johnny needs O&M training, when they know how well Johnny can see, and how well he seems to get around in familiar places. Tactful but firm public relations is needed with parents, counselors, other teachers, administrators and the community (personnel correspondence)." It is conceivable that if widespread information campaigns were conducted by all agencies for the blind informing the public that only approximately 1/4 of the legally blind are totally blind then, in time, the particular problems alluded to in this section would become of less importance to those who have low vision.

EVALUATION OF FUNCTIONAL VISION

While the O&M specialist can generally consider himself lucky to know the Snellen distance acuity there has been a growing realization that, while this is a measure which can be determined with relative ease, it does not tell him much about how effectively the client can use his vision. Three papers relating to field assessment were delivered at the 1970 Low Vision Conference and this is an indication that the vision specialist can provide clinical information that will be of more use to the O&M specialist in his work, e.g. Esterman's Quantitative Field Evaluation in which different parts of the visual field are weighted more heavily than others on account of their functional importance.

Richterman (1966) contended that visual efficiency in independent traveling could only be measured by actual performance rather than by laboratory indications and Hughes' (1967) article described how students navigated a carefully planned course of increasing complexity. By adopting this procedure, Hughes could determine how well the student could see trees, curbs, street signs and traffic patterns under various light intensities. Doyle and Darling's (1971) suggestion to measure the distances from which the client perceives "various objects" under various lighting conditions shows how general the descriptions of such functional vision evaluations remain after so many years. In order to give the O&M specialist something more concrete, four examples of functional vision evaluations are provided.

The evaluation at the Missouri School for the Blind is "to determine the minimum lighting conditions and/or furtherest distance from the object possible to identify the following:

(1) Persons, gross and small objects.

(2) Drop-offs including stairways and curbs.

(3) Potential travel hazards including doors ajar and overhangs.

(4) Lighted intersections and crosswalk signs.

(5) Moving persons and moving vehicles.

This evaluation is said to take from 3-5 hours to complete and at the school it is repeated at least every two years.

At the Maryland School for the Blind, the evaluation takes the following form:

(1) Can he recognize people? Sex___ Height___ Color of hair___ Race___

(2) Can he recognize motor vehicles? Distance___ Type___ Color___

Licence Number________

(3) At what distance can he see the following: Curbs___ Stairs___

Bus Bench___ Stop Sign___ Trash Can___ Bicycle___ Grassline___

Gas Pump____ R.R. Tracks____ Crosswalks____ Doorways____

Across Road____

(4) Can he see changes in terrain? Slopes____ Broken Sidewalk____

Asphalt____ Cement____

(5) Can he identify the following by sight? Currency____ Coins____

Color____ Revolving Door____

(6) While walking straight ahead, does he see and avoid the following:

Shoppers looking in windows____ Hedges____ Opening Store____

Doors____ Does he hug the wall while traveling?____

(7) Does he read his own mail? What size print can he read?____

(8) Does he see TV? Yes____ No____ At what distance?____

(9) At what distance is he aware of an approaching car using his

sight?____

(10) Does he have difficulty with: Stairs____ Curbs____ Passerby____

Low obstacles____

(11) Does he read his watch by sight?____ Can he read a wall clock____

At what distance?____

(12) Does he use guides? People____ Walls____ Landmarks____ Windows____

Grass line____

(13) Can he locate the following by sight? Dropped coins____ Books____

Soap____

(14) Can he dial a telephone by sight?____

Key: D for day N for night

The following evaluation conducted at the West Virginia Rehabilitation Center takes from 3-6 hours to complete according to the information supplied by Mr. Bill Casto:

(1) Interview

(2) READ PRINT

- a. Classified ads
- b. News story print
- c. Typewriter material
- d. Large print material
- e. Sub headlines
- f. Major headlines

(3) OBJECT RECOGNITION
(Examples)

- a. Nail clippers
- b. Drinking glasses-coffee cup
- c. Ash tray
- d. 8x10 photograph
- e. Coffee percolator

(4) INDOOR TRAVEL VISION

- a. Identify stationary objects using varying backgrounds
- b. Identify moving objects using varying backgrounds
- c. Reaction to changes in degrees of lighting

(5) OUTDOOR TRAVEL

- a. Make safe, accurate street crossings at:
    - 1. + shaped intersections
    - 2. T shapted intersections
    - 3. Off-set intersections
- b. Travel to house designated by verbal description
- c. Travel from residential area to business destination
- d. Describe places of business in shopping area
- e. Travel in a drug or department store and describe merchandise
- f. Travel in business area involving traffic-signal controlled intersections.

At the Onondaga County "Lighthouse" (Syracuse, N.Y.), Mr. Bill Wiener gives a Functional Vision Evaluation rating the individual's performance on a four-point scale:

4. Performs safely and/or effectively all of the time
3. " " " " " most " " "
2. " " " " " some " " "
1. " " " " " none " " "

The 27 tasks consist of the ability to see:

1.	Doorways and other openings	
2.	Motion of people, doors and objects	
3.	Drop-offs indoors	Distance:
4.	Obstacles indoors	Avoid
5.	Drop-offs outdoors	Distance:
6.	Obstacles outdoors	Avoid
7.	Depth	
8.	Sidewalk	Follow visually
9.	Cars	
10.	Motion of cars	Follow
11.	Street signs	Locate
12.	Street signs	Read
13.	House numbers	Locate
14.	House numbers	Read
15.	Store signs	Locate and reach
16.	Color	Distinguish
17.	Changes in terrain	
18.	People	Discriminate
19.	Crosswalk signs	Follow
20.	Traffic light	Presence
21.	Traffic light	Color
22.	Newspaper headlines	Read
23.	Newsprint	Read

and able to:

24. Cross intersection not controlled by traffic light (using vision)
25. Cross intersection controlled by traffic light (using vision)
26. Locate objects visually
27. Function in transition areas of differing amounts of light.

According to Tapp, some of the common problems revealed through their school's evaluation are that the students are often afraid of traffic and may never have crossed at lighted intersections. Also, many of the students need orientation training since they cannot keep track of where they are going. It seems likely that these problems arise from protective attitudes of parents who have thought it "unsafe" for their child to travel alone.

Apple and May (1971) suggest that the indoor environment should be the first concern with the following being noted under three sets of conditions: (i) both the client and object are stationary; (ii) the client is stationary but the object is moving, and (iii) both the client and the object are moving.

(1) Size and intensity of glare areas
(2) Dependency on contrast
(3) Presence and nature of scanning.

The client's estimation of relative distance, depth perception and "speed and angle" should also be considered, according to Apple. He advises that if outdoor routes are chosen for evaluation, they should be chosen for the variety of visual experience and contrast rather than for the complexity of detail.

From an inspection of these four examples of evaluation, it is clear that much still remains to be done in terms of making the evaluation items, not only more specific, but more standardized. If "objects" are to be identified then it is important to know what these objects may be as well as the type of varying background; if a "slope" is to be seen as a change in terrain, then what constitutes a sl pe; what is an indoor drop-off and what are the lighting conditions? Some research is now underway at Palo Alto to try to overcome the many objections that can be made to such idiosyncratic evaluations but, as an area of research, it is fraught with many difficulities. Donald Blasch, Director of the Institute of Blind Rehabilitation, Western Michigan University, states: "We have developed several assessments of functional vision procedures, but have not been happy with any of them (Personal correspondence)."

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Next issue: Part II. Perceptual Training

Bennehoff, Ronald W.
Orientation and Mobility Program
Western Michigan University
1972

"A Comparitive Study of the Effects of Sun Angle on the Distance Vision Outdoors of Low Vision Persons with Glaucoma and Macular Degeneration"

The effects of sunlight at different angles (ahead of, behind of, or beside the person) on the efficiency of low vision distance vision was the subject of this study. This topic is relevant to the evaluation of differences in visual performance among patients in a single etiological group.

The subjects of the study included seven low vision veterans; four with glaucoma and three with macular degeneration. While all subjects met the definition of legal blindness, no data was given as to acuity or field measurements. The experiment was performed in an outdoor environment chosen after consideration of visibility factors such as background coloration, contrast, and sun angle. Subjects approached stationary targets (8 1/2"x 11") of maximum and minimum contrast under three conditions of sun angle and made blurred and positive identifications. Effects of color, contrast and pain in the eyes were recorded.

Direct confrontation with bright sun light deteriorated the efficiency of discrimination and identification of targets in both the glaucoma and macular degeneration patients. The most favorable condition for identification was sun behind the subject, followed by sun positioned to the side. There was considerable variation in performance among individuals. Both groups experienced problems in color discrimination and tearing or ocular pain. Specific comparison of the effects of sun angle on distance vision of glaucoma and macular degeneration patients could not be drawn.

Dyer, Charleye
Smith, Audrey
Orientation and Mobility
Program
University of Pittsburgh
1971

"The Effects of Vision Utilization on Distance Visual Efficiency"

This study investigated whether visual efficiency could be increased, and under what conditions. The problem was researched through use of a Before-After Control Group design. It was hypothesized that there would be no difference in visual efficiency between two groups, one exhibiting active visual and motor participation, and the other remaining non-active. It was also hypothesized that there would be increases in visual efficiency in both groups, with only the active group having a significant increase. Before and after a one-half hour period of visual distortion, wearing +4,75 diopter lenses, the two groups were tested on three measures of visual efficiency. (Eye-hand coordination using flashlight pointer on a maze projected at a distance of twenty feet.)

Results of the study supported the research hypothesis for the active group. The hypothesis indicating non-significant increases in the mean score performances of the control group was rejected as this group exhibited decreases in mean score performances of visual efficiency.

It was concluded that visual efficiency could be improved, especially with a training period consisting of active visual participation in the environment. The findings are discussed and suggestions are given for further investigation. The authors suggest the need for replication on a larger scale with additional control groups in order to study the separate effects of mere use of vision as opposed to the use of vision with sensory-motor feedback.

Hill, J. Allen
Orientation and Mobility Program
California State University,
Los Angeles
1972

"Medical Aspects of Eye Disease and Its Implications on Mobility"

The purpose of this paper was to review the significant characteristics of a selected group of eye conditions and to discuss the implications of these conditions upon the teaching of Orientation and Mobility.

The author provides a description of the causes, types, and characteristics of Cataracts, Glaucoma, Retinitis Pigmentosa, Retrolental Fibroplasia and Diabetic Retinopathy.

In addition, he provides a discussion of his perception of the implications each condition has upon teaching Orientation and Mobility. The discussion relates to psychological, medical and behavioral reactions to the condition and/or to aspects of possible teaching approaches.

The following are some of the implications relating to low vision training:

Cataracts:	(pre-operative) Train to use minute central and good peripheral vision effectively by scanning, eccentric fixation, and use of protective mobility techniques. (post-operative) Requires adjustment to distortions caused by aphakic lenses. Author did not feel mobility instructor would be involved to any extent with training or retraining this type patient.
Glaucoma:	Functional vision evaluation is highly important. Even minimal levels of vision such as L.P. should be trained for utilization of landmarks such as doorways. Avoid scheduling mobility lessons immediately after application of medication. Where vision has stabilized, it may not be necessary to teach cane technique unless the student has no night travel vision.
Retinitis Pigmentosa:	Night lessons should be given to utilize the other senses and use of blindfold avoided.
Retrolental Fibroplasia:	Students may have motor problems, poor retention span, poorer concept development, and severe psychological and emotional problems which will affect mobility training.
Diabetes:	Fluctuating vision can create a great deal of frustration for the blind diabetic.

Pickett, Beal B.
Orientation and Mobility Program
Western Michigan University
1971

"Increasing Visual Efficiency Through Activity"

This research was conducted at two state schools for the blind to determine the value of ball skills in increasing visual efficiency among low vision students. In his review of literature, the author cites Barraga's, Strum's and E. J. Gibson's findings that visual perception can be increased through various experiences and familiarity with objects.

The experimental group was composed of ten students within the visual acuity range of 20/100 to 20/800, selected after passing a visual screening test. The control group was selected and matched according to scores received on the screening test.

It was hypothesized that a significant improvement at .05 level in mean gain of experimental group over the control group would be found after visual efficiency training. A visual efficiency test was administered to both groups prior to training. The experimental group received two hours of instruction and ten or more hours practice with ball skills, consisting of catching, batting and dodging balls. The visual efficiency test was readministered as a post test to both groups. The visual efficiency test consisted of rapid recognition of slides of geometric forms. Data was subjected to t test for analysis.

The improvement in responses did not reach the level of significance. The experimental group increased an average of 6.4 responses per subject; the control group increased an average of 2.1. There were three times as many decreases in the control group as in the experimental group. Selected individuals showed tremendous improvement. One experimental subject increased 34 points on the test.

The author makes recommendations for improving training conditions and revision of the visual efficiency testing.

Dechaine, Gary
Huberman, Helen
Peripatology Program
Boston College
1972

"Proposed Sample Items for a Form Assessing Visual Efficiency"

Factors to assess in Indoor Environment

I. Illumination (the reaction of the client was:)
   1. Room too bright ____
   2. Too much glare from a specific area ____
      (specify area ______________________________)
   3. Room bright enough for eye comfort ____
   4. Room too dim ____
   5. Room dark ____
   6. Illumination in the room was correct to:
      a) brighter than before ____
      b) dimmer than before ____
      c) almost dard ____
      d) area of glare was shaded ____

II. Characteristics of objects perceived in the room

	Object	Object	Object	Object
A. Brilliancy				
1. Very bright	____	____	____	____
2. Bright	____	____	____	____
3. Average	____	____	____	____
4. Dim	____	____	____	____
5. Dark	____	____	____	____
B. Object-Ground Contrast				
1. Bright on dark	____	____	____	____
2. Dark on bright	____	____	____	____
3. Bright on bright	____	____	____	____
4. Dark on dark	____	____	____	____
C. Color:	____	____	____	____
D. Size:				
1. Width	____	____	____	____
2. Height	____	____	____	____
3. Depth	____	____	____	____
E. Shape:				
1. Rectangular	____	____	____	____
2. Circular	____	____	____	____
3. Triangular	____	____	____	____
4. 3 dimensions	____	____	____	____
5. Complex	____	____	____	____

III. Location of objects perceived in the room

A. Location of object relative to client:	Object	Object	Object	Object
1. Straight ahead	____	____	____	____
2. 5-45 degrees left	____	____	____	____
3. 46-90 degrees "	____	____	____	____
4. 5-45 degrees rgt.	____	____	____	____
5. 46-90 degrees "	____	____	____	____
B. Distance from object to client	____	____	____	____

IV. Methods used to locate objects by the client:

	Object	Object	Object	Object
1. Eye scan only				
2. Head scan only				
3. Both 1. and 2.				
4. Vertical scan only				
5. Horizontal scan				
6. Both 4. and 5.				

V. Degree of perceptual recognition of objects by the client:

	Object	Object	Object	Object
1. Vague "something"				
2. Named form				
3. Named the object				
4. Described details				

VI. Time taken by client to recognize object (record in seconds), final recognition:

Object	Object	Object	Object

VII. Adaptation to sudden changes in illumination:

A. Time lapse needed to adjust to the sudden darkening of a well lighted room (record in seconds):

1. Trial	Trial	Trial	Trial	Trial

2. Reported phenomena during the above trials:
   - a. Normal adaptation ______
   - b. Saw lights ______
   - c. Saw flashes of color ______
   - d. Felt vertigo ______
   - e. Any other ______

B. Time lapse needed to adjust to the sudden lighting up of a dark room (record in seconds):

1. Trial	Trial	Trial	Trial	Trial

2. Reported phenomena during the above trials:
   - a. Normal adaptation ______
   - b. "White out" ______
   - c. Flashes of color ______
   - d. Vertigo ______
   - e. Any other ______

VIII. Perception of movement:

	Trial	Trial	Trial	Trial
A. Movement of client in the room:				
1. Stationary				
2. Moving slowly				
3. Moderate speed				
4. Rapid pace				
B. Movement of object in the room:				
1. Stationary				
2. Moving slowly				
3. Moderate speed				
4. Fast speed				

C. Any observed effects on object recognition caused by movement:

Trial ____________________
Trial ____________________
Trial ____________________

IX. Instructor's evaluation of the client's visual efficiency in the above trials:

A. Optimal room illumination ____________________
B. Optimal distance for object recognition ____________________
____
C. Optimal scanning techniques ____________________
____
D. Optimal contrast for object recognition ____________________
____
E. Time needed for optimal object recognition ____________________
____
F. Other important variables ____________________
____
____
____

Factors to assess in Outdoor Environment

I. Illumination:
1. Bright sun facing client ________
2. Bright sun not facing client (Specify sun location) ________
____
3. Moderate sunlight ________
4. Cloudy ________
5. Dusk or dawn ________
6. Evening ________
7. Night with bright lighting ________
8. Night with dim lighting ________
9. Other (specity) ____________________

II. - VIII. Use same numbered factors as in Indoor Evaluation.

IX. Client's estimation of object's distance from him: (after each estimate, mark "C" if estimate was correct)

	Object	Object	Object	Object
1. Initial estimate				
2. Final estimate				

X. Client's estimation of object's velocity (after each estimate, mark "C" if estimate was correct.):

1. Initial estimate				
2. Final estimate				

XI. Client's orientation toward sunlight and shadows:
1. Points to sun _____. 2. Turns face towards sun _____. . Names direction of sun _____. 4. Recognizes major shadows _____. 5. Names direction shadows face _____. 6. Any other _____; specify: ____________________
____________________.

XII. Client's estimation of path of travel of object relative to him;

	Object	Object	Object	Object
1. Parallel				
2. Perpendicular				
3. Angling towards himself				
4. Angling away				

XIII. Chief environmental clues used to locate objects:

	Object	Object	Object	Object
1. Recognition of surroundings				
2. Color/contrast				
3. Recognition of form				
4. Key details				
5. Perception of whole object				
6. Any other (specify)				

XIV. Client's ability to use perception:
If binocular vision is possible for the client, this can be evaluated merely by asking him the size of objects and how far away; if monocular vision is used, depth perception may be a combination of, or any one of, these factors: recognizing relative sizes of objects; recognizing how large they appear at various distances; u of perspective; inferences from partial blockages of view; these c be evaluated as below:

A. Estimation of object's size relative to nearby familiar objects:

	Object	Object	Object	Object
1. Much smaller				
2. Smaller				
3. Same size				
4. Larger				
5. Much larger				

B. Estimation of nearby familiar object's distance from the client, in feet:

Object	Object	Object	Object

C. Use of inferences to judge distance of object from client:

	Object	Object	Object	Object
1. Interruption of form by object just ahead:				
2. Comparison to objects just behind:				
3. Comparisons to objects on either side:				
4. Use of perspective:				
5. Final estimation of distance from client to object:				

Turner, Ron
Peripatology Program
Boston College
1971

"Mobility Vision Evaluation Form"

Name__________ Lesson__________ Date__________

Starting Point__________ Objective__________

Prevailing Light Conditions__________

Outdoor________ Indoor________ Familiar Area________ Unfamiliar Area________

OBJECTS:		1st see	1st sure		1st see	1st sure		1st see	1st sure		1st see	1st sure
traffic light:	same corner			across street			colors					
street sign:	same corner			across street			read at					
signs:	over-hang			build-ing			window					
cars:	stop'd			mov'g			colors					
pedes-trians:	stop'd			mov'g								
ob-stacles:	'phone pole			sign post			fire hydrant					
curb:	down			up			=			1		
x-walk:	white lines										---	
overhanging obstacles												

(over)

Comments:

igoroso, Hugo
nstructor
eripatology Program
oston College
1971

"Sample Chart for Gathering Performance Data"

Orientation of Illumination source to object front/back/side	client front/back/side	Objects	Distance F.P.	F.J.	Size	Stationary	Moving S/M/F	Color/ Contrast	Head Scan	Com- ments
— N.A —	✓	curb (1 11) walk-driveway crosswalk pole(telephone-streetlight) street sign traffic lights car baby carriage person bicycle	E 20'	C 10'	4"x4"	✓	Cl ✓	curb-cement street - blkTop	No	What is effect of parking

NOTE: code - -
F.P. = first perception
F.J. = final judgement
E = error
C = correct
Cl = client
ob = object

EDITORIAL

This is the third edition of Low Vision Abstracts. We want to thank all of the people for the support they have given in the initiation of this unique periodical. All of the articles deal with the uses of distance vision.

Below is a table indicating the number of contributions which have been abstracted or published in total in Low Vision Abstracts during these three issues:

Contributors

Practioners in the field	2 items
University programs:	
Boston College	6 "
Western Michigan University	4 "
Pittsburgh University	4 "
Los Angeles State University	3 "
No. Colorado State University	1 "
Florida State	2 "
*Stephen E. Austin State University	
*Royal Guide Dogs for the Blind (Victoria, Australia)	
*National Mobility Centre (Birmingham, England)	

The subject matter contained in Low Vision Abstracts has delt with the following areas:

Low vision evaluation	9 items
Training	3 "
Low vision aids	2 "
Misc. (includes general surveys, medical aspects, review of literature, etc.)	10 "

The contributors indicate that there has been a very strong development in the area of functional vision assessment throughout the field. This appears to be the next major advance in the development of orientation and mobility for low vision individuals.

Low Vision Abstracts is being distributed to university programs , rehabilitation and low vision organizations, and past contributors In addition, we have received requests from colleges of optometry to have the Low Vision Abstracts sent to their libraries and this has been done.

Training program school for Orientation and Mobility Specialists	10
Research centers	2
Low vision organizations	9
Rehabilitation organizations	10
College of Optometry	11
Educational organizations	3
Individual Contributors	23

---

* These three programs training mobility specialist were added on recently, and have not had an opportunity to contribute articles for abstracting.

Submissions on the subjects related to distance vision would be welcome from the practitioners and students in Optometry. Because of the interest shown by the colleges of Optometry, we expect that we might receive submission from this source.

We are very pleased to report that college programs training mobility specialists are receiving inquiries from students in other programs regarding the Low Vision Abstracts. The universities whose students have contributed to the Abstracts have received inquiries regarding papers contributed by their graduates.

Several features within the Abstracts have had an interesting response.

1. Current Bibliography.

   We have been publishing approximately 30 new references per issue. Most of these come from papers published by students. It appears that this feature is helpful. We have received an offer of assistance from Vision Science Index (U.C. Berkeley) in the preparation of the bibliography.

2. Research Topics.

   None of the research topics published to date have been used directly for student papers. Some of them, however, have been incorporated in part in student papers. We would appreciate any letters regarding the relevance and relative importance of this feature.

3. Functional Low Vision Assessment Forms.

   Many rehabilitation organizations or individual practitioners are developing functional low vision assessments. We are initiating this feature to publish these as space allows. If you have a functional low vision assessment data form, please forward it to us with a clear explanation of it and the procedures for its use.

4. Feature Articles.

   In the past, we have tried to have contributions of feature articles from university faculty on topics regarding low vision as it relates to mobility. We hope to continue this policy insofar as faculty members are able to contribute. We do notice, however, that students many times develop very excellent papers on subjects having to do with low vision. We have incorporated part of one such paper in this issue and will include the other parts in our next issue.

We have enjoyed editing and publishing the Low Vision Abstracts very much. It appears to us that the contributions submitted have been more interesting and varied with each issue of the Abstracts. We hope that our readers enjoy it and that it will be of assistance to them in the important developments in mobility for low vision persons.

SUGGESTED RESEARCH TOPICS

1. Compare congenital low vision persons with adventitious low vision persons on awareness of field defects (size, location, density).

2. Compare congental low vision persons with adventitious low vision persons on color identification using Standard color perception test such as Farnsworth B.

3. Compare the performance of a standard mobility task of subjects wearing vision reduction goggles 5/200 with no field defect and persons wearing vision reduction goggles of 5° field with no acuity defect.

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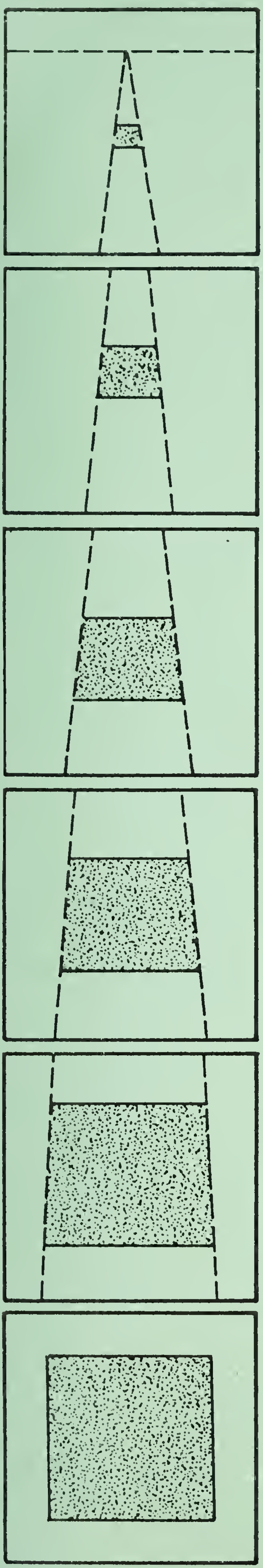

LOW VISION ABSTRACTS

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CONTENTS

FEATURE ARTICLE

A Survey of Developments in a New Field: Orientation and mobility for the low vision person.
PART II. Optical aids clinics and optometry, Optical Aids for Mobility and Training in the Use of Optical Aids
Terry Davidson 1

ABSTRACTS

Developing a Mobility Evaluation Procedure for Low Vision Clients 11

Night Viewing Goggles for Night-Blind Travelers 12

A Proposed Syllabus Guide for the Instruction of Orientation and Mobility for the Low Vision Student .. 14

Factors for Consideration by Orientation and Mobility Instructors when Developing a Distance Low Vision Training Program 15

FUNCTIONAL LOW VISION EVALUATION

Summary - Low Vision Aids ... 16

Functional Vision Evaluation Distant Vision - Test Area Test Area #1 22

Functional Vision Evaluation Distant - Moving Test Area #2 23

Functional Vision Evaluation Test Area #5 24

COVER:

The illustration is of successive transformations of the image of a square of pavement while a person is walking along a street. It was sketched from a figure given by J. J. Gibson in The Perception of the Visual World. "A transformation is a regular and lawful event which leaves certain properties of the pattern invariant."

The motif of Low Vision Abstracts is TRANSFORMATION of Orientation and Mobility and Peripatology through an increased understanding of the visual environment of the low vision person.

LETTER TO THE EDITOR 27

EDITORIAL 29

SUGGESTED RESEARCH TOPICS 29

CURRENT BIBLIOGRAPHY 30

A SURVEY OF DEVELOPMENTS IN A NEW FIELD: ORIENTATION AND MOBILITY FOR THE LOW VISION PERSON*

Part II.

Optical Aids Clinics and Optometry, Optical Aids for Mobility, and Training in the Use of Optical Aids

By Terry Davidson
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OPTICAL AIDS CLINICS AND OPTOMETRY

Froistad (1966) states that in the report of the Committee on Standards and Accreditation of Mobility Services, the universities preparing mobility instructors were charged with the responsibility for making their graduates aware of the potential use of low vision aids. It is probably true to say that little or nothing is being done at the university level to adequately prepare instructors to work with the low vision person person and, by the same token, there are few positions that are open in which the professional can specialize in this area of interest. The O&M Department of the West Haven (Conn.) V.A. is presently in the process of establishing a permenent low vision position in the Center so as to continue work in the area and it is such developments as this that are indicative of the future trends in the preparation of O&M professionals. A thorough knowledge of what Optical Aids Clinics and optometry can do for the low vision person will be essential and, for this reason, a review of what is known is attempted in this and the following two sections.

Although the Optical Aids Clinics were evidently set up for the correction of near (reading) vision, there are occasional references to the correction of distance vision. The major thrust concerning distance vision has so far been in the provision of hand-held telescope devices for use in "spotting" while the client is stationary. Some more varied approaches will be detailed.

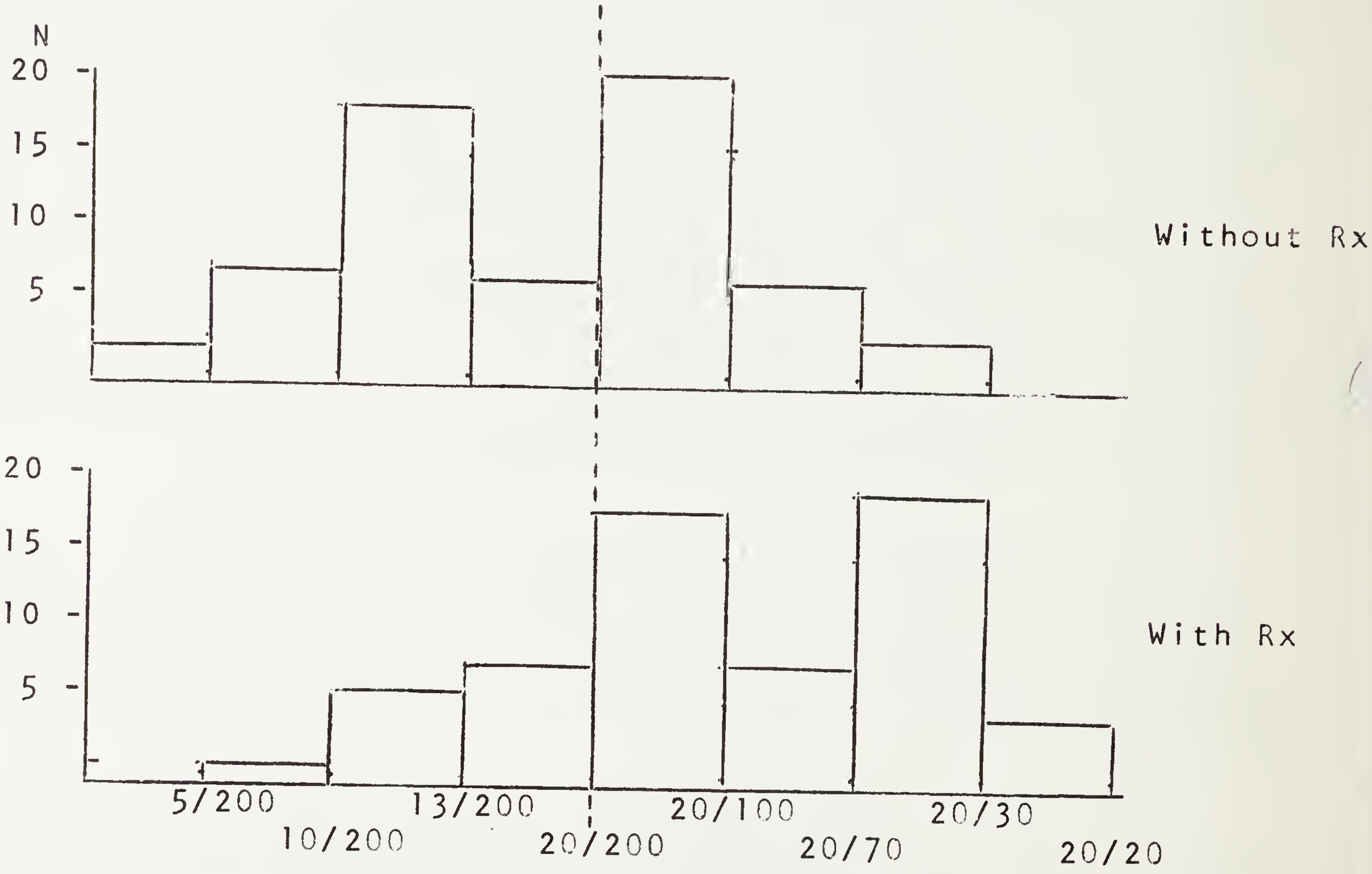
Of the 421 people reported on by the Rotary Low Vision Clinic (Milwaukee), only 19 stated that their primary purpose was for mobility and independent travel and in the follow-up; only half of these people were making "routine use" of the aid (the other half were not using the aid). The following table showing the success obtained in 100 consecutive cases at that clinic appears to indicate not only a greater difficulty in providing a distance aid, but a greater resistance to acceptance.

---

* This paper was originally written as part of a course work while M Mr. Davidson was enrolled as a student in the Orientation and Mobility Program, University of Pittsburg. It will be concluded in the next issue of Abstracts.

Result	Near	Distance
Helped	80	25
Not helped	5	24
Could have been helped but not desired	15	51

The improvement in distance acuity is shown for 64 patients fitted with prescription at the Richmond (Va.) Low Vision Aids Program (Hiatt, Waddell and Ward, 1963).



Changes in visual acuity before and after prescription
N = 64

Krieger (1967) asked his patients what was their greatest visual need and, while there were 849 mentions of close needs, there were also 299 mentions of distance needs (distance needs being defined in terms of movies, TV and travel - - but, with no breakdown within these three categories). In a follow-up of 250 patients, Krieger asked whether their distance needs were being met and the following table shows success in terms of visual acuity, It is interesting to note that only in the lowest visual category (less than 2.5/200) is there a significant lack of success.

Visual Acuity	% of sample whose needs met
0.5/200 -- 2.5/200	15.7
3/200 -- 5/200	57.4
5.5/200 -- 7.5/200	58.5
8/200 -- 10/200	55.2
13/200 -- 20/70	67.5

Krieger prescribed 206 aids for distance in the following proportions by type of aid:

Type	Number
Standard lenses	145
Telescopes	
Monocular	40
Binocular	7
Multiple pinhole spectacles	7
Contact lenses	7

Takemoto and Egi (1967) report that at the Hawaii Low Vision Clinic, 44 telescopic lenses were prescribed with only 5 being rejected. They were successfully used for spotting signs, seeing a blackboard, observing sporting events and sightseeing, but there is no indication of the degree to which they were used in general mobility and no breakdown between the different types of telescopic aids that were prescribed (see section on "Distance Aids").

While the use of standard lenses and hand held aids (for "spotting" while the person is stationary) is accepted, the provision of distance (telescopic) aids has apparently been held in disfavor in the U.S. Margach, of the Pacific University College of Optometry, has been one of the most vocal in denouncing the use of telescopics in mobility:

> A trial of the above suggestions (to evaluate aids by the mobility specialist himself looking through them) will yield only one answer to the question of the side-effects

> of low vision aids on mobility and orientation -- "disaster." Here is where the old saw arose, "If you are not legally blind, use a low vision aid and you will be." The effect of ophthalmic telescopes and microscopes (especially the former) on the visual field of the user is catastrophic insofar as travel, while wearing the aids as spectacles, is concerned. If the client needs such devices for vocational or avocational purposes, some method of getting them out of the way when he wishes to travel must be found (Margach, 1970, p.25).

in contrast with this opinion is that of Bier's:

> It is still widely believed that telescopic spectacles are not to be looked upon as permanent correction but while everyone cannot wear them constantly a large number of patients can, if that is their desire .... whether telescopic lenses are for permanent or only occasional use is an entirely individual matter, because the patient's sight, case history, age, motive, occupation and so on, are all governing factors (Bier, 1970, pp. 219-220).

A recent report by the author (Davidson, 1972) has support for Bier's opinion and the common criticism of the drastic reduction of field is becoming less valid since Designs for Vision, Inc. (New York) have announced their new 40° (monocular) Wide Angle Telescopic. This aid is currently being evaluated at the O&M Department of the N.Y. Association for the Blind (Lighthouse). Korb (1970) has described how the "Bioptic" (usual lens correction plus a compact Rx telescopic unit mounted in that carrier lens) has been employed in gaining driving licenses for 26 people in Massachusetts. The bioptic units prescribed were of the following powers:

2.2x	15
3.0x	10
1.7x	1

All 26 persons concurred with Korb's opinion that the use of the telescopes should be reserved as a "spotting system" and should not be employed as a continual means of visual correction. More detail as to use is provided by Kelleher, Mehr and Hirsch in their published case report (1971) on the first person to gain a license in California using a Bioptic telescopic system (3x).

> The subject learned to vary his use of the bioptic to the driving situation. In light traffic in the city or on the freeway, for example, the bioptic is used quite often because hazards are most likely to approach from far in front; good distance vision is desirable. In heavy traffic, on the other hand, where traffic is moving slowly, peripheral vision is most important since hazards are most likely to approach from the sides; the bioptic is not used as often. Twisting mountain roads where it is not possible to see far ahead call for a limited use of the bioptic. The subject feels that the

> bioptic should never be used exclusively under any conditions, but always as a spotting system. The amount of spotting is the only factor that will change according to the conditions (pp. 775, 776).

Not all aids pertain to the provision of lenses and the improvements of acuity as the following letter from Dr. K. Nolen Tanner shows: (Dr. Tanner was previously Director of the Oregon Optical Low Vision Aid Clinic).

> The individual with impaired peripheral vision very often has a mobility problem but unfortunately it is rarely amenable to management by low vision aids. I have had experience with one patient in this regard, however, that might be of interest to you. This patient had a brain lesion which resulted in loss of almost his entire inferior field in both eyes, leaving the superior field quite intact. This patient was rather severely handicapped in walking. He was unable to see the floor, his feet, or walking stick without dropping his head and eyes into a strongly depressed position.
>
> To help this patient we were able to fabricate a special pair of glasses which incorporated very large prisms of 45 degrees apex angle, mounted with the base down. This had the effect of throwing the entire inferior field, up and out, so that this patient was able to see the tip of his walking cane as if it was about five feet in front of him. With a little practice, he was able to improve his mobility very considerably and found these appliances to be quite useful.

It seems appropriate at this point to quote Richterman (1966): "A better orientation and a closer liason between the low vision clinic and the travel instructor would prove much more effective in quicker and better utilization of (special lenses) in travel training (p.236)."

OPTICAL AIDS FOR MOBILITY

Koehler (1971) suggests that optical aids for mobility fall into two groups: (1) to improve the visual acuity range and (2) to improve the environment (sunvisors, large-brim hat, sunglasses of various light transmission).

Probably the most comprehensive and best known of the catalogs of low vision aids is that published by the Low Vision Services of the New York Association for the Blind. It lists the following distance aids:

"Selsi" 2.5x Monocular (focusable)	$ 7.50
"Selsi" 2.5x Sport Glasses (focusable)	$11.25
"Selsi" 2.8x Sport Glasses (focusable)	$ 8.50
"Selsi" 2.8x Monocular (focusable)	$ 4.00
"Huntscope" 4x Monocular (fixed focus)	$15.00
"Selsi" 6x30 Monocular	$12.00
"Selsi" 6x15 Miniature Monocular	$ 9.75
"Selsi" 6x18 and 8x24 Monocular	$13.50
"Selsi" 10x Miniature Monocular	$10.50

With regard to the second group of aids, S. Petrizzi has found that in the diagnostic O&M program at the Lighthouse, 30% sunglasses (medium) are the most popular, followed by 50% (light), then 20% (dark) and least popular, polaroid.

Paul Scheel of the V.A. Hospital, West Haven (Conn.) also uses the "Selsi" aids and finds the 6x30mm. and the 10x20mm. to be the most useful. For the person who desires an inconspicuous and readily available aid he has prescribed the Keeler 2.5 telescope that is mounted on a ring. The telescope can be kept on the palm side of the index finger so that when the person wants to use the aid he looks through the telescope nestled in the cupped palm. This aid has proven particularly useful with those who have fairly good gields of vision left. The cost of $60.00 per unit is, however, quite high.

The mail-order firm of Haverhills sells the extremely compact "Emoscope" (2.5x) but the price of $17.95 is a high price to pay for the advantage of its small size (1 1/2 " length and 3/4" diameter). This author knows of no experience in the use of this aid with low vision persons.

At the Low Vision Clinic in Hawaii, the aids that are kept on hand for prescription are:

Kollmorgen 1.7 and 2.2 Telescopic Spectacles
Telesight Monocular Telescopic Loupe 2.2x
Selsi Folding Sports Glasses 2.5x
Aloe Distance Unit 3x
Telecopter 4x
Selsi miniature wide angle binocular 7x23
Selsi prism monocular 7x50
Selsi monocular 10x

The June 1971 Price List of Designs for Vision, Inc. (New York) includes the following distance aids:

(1)	Full diameter (aperture) Telescope; 1.3x -- 4.0x	$40 - $70
(2)	Bioptic (Upper section Bioptic telescope mounted in a carrier) 1.7x -- 4.0x	$60 - $80
(3)	Trioptic (Upper section Bioptic telescope; center section regular Rx carrier and lower section microscope). Telescope 1.7 x -- 4.0x Microscope 2 x --10x	$85 $105

There is a wide range in both the type and price of aid available. It behooves the O&M specialist to become familiar with the applicati to mobility of a representative number of these. The O&M specialist in training will be prompted to make practical investigations if the universities have some of these aids available for him to use with clients during his practicum experiences.

TRAINING IN THE USE OF OPTICAL AIDS

While the use of aids (particularly hand-held) is often mentioned, it is practically impossible to find references to the training procedures that are employed. By this lack of information it may even be surmised that in many cases the client is given the aid and told to got and use it. If this is the case, then it is not surprising that many people do not continue with the use of the aid supplied.

Some general instructions in teaching someone to use one of the hand-held aids have been given in the Long Cane News by S. Petrizzi:

(1) Show the client the proper way to hold the aid;

(2) Show the client how to focus the aid;

(3) Allow the client to practice the ability to quickly focus the aid;

(4) Show the client how to focus street signs, house numbers, subway stops and commerical signs;

(5) Show the client how to find a sign post first and follow the pole up to the sign. Keep in mind that

  (a) most traffic lights and street signs are located near or on a street corner

  (b) house numbers are usually located on or near the door frame;

(6) Advise the client that he should stress the logical location of what he is trying to find;

(7) Encourage the client that the travel aid becomes more practical through practice and use;

(8) Allow the client the practice of riding subways, buses and using the aid sitting or standing. Wait until the subway train or bus stops, and then focus;

(9) Remind or caution the client that while traveling, he use a combination of his sensorium and that this aid has to be used in conjunction with the rest of this combination.

Scheel of the V.A. Hospital, West Haven (Conn.) mentions the hours of tedious practice that must be done when the user's field is extremely restricted. This practice must be done in order that the best image is projected onto the retina through proper alignment of the visual spot with the ocular of the aid. Bier (1960) also mentions the need for perseverance and patience on the part of both the patient and the practitioner (in learning to use telescope aids) and warns "a number of patients with partial sight are not willing or prepared to make the necessary mental effort to see and to adapt themselves to the special lenses now available (p.202)."

Mr. Kenneth Tapp, writes of his experience at a school for the visually handicapped:

> Keep in mind that the least power that can be of advantage to the client the better. The higher the power, the less the field, the less the light entering the retina, and the harder to hold the image steady....Training a client to use an aid is very important. Too often an instructor will hand a person a distance vision aid, show him how to focus it, and leave the person to his own frustrations. These aids are not always easy to use. It takes practice pinpointing the object; usually it is better to have the person look toward the object with his eye, then bring the aid up to the eye, rather than to search out the object with the aid already held up to the eye. Quick focussing also takes practice. To focus an aid for your client during practice sessions, focus it on the object for yourself, then hand it to the client - - it should be very close to focus for him.

In the use of telescopic spectacles, Bier (1970) suggests three stages of training similar to those of Apple & May:

(1) Patient stationary; object stationary

(2) Patient stationary; object moving

(3) Patient moving; object moving

He gives the following advice:

(1) Develop each stage fully until performed without undue difficulty;

(2) Acquire tolerance gradually - - start at 1/4 to 1/2 hour sessions and extend by 1/4 hour every few days;

(3) Use daily (but at different times in the day);

(4) Patient will have to learn to move the head rather than the eyes;

(5) Explain that objects will be nearer and the field will be narrower;

(6) Patient may complain initially of dizzy, swimming, and unsteady feelings;

(7) The higher the magnification, the more difficult and longer the period of adaption;

(8) Reduced aperture systems need instructions similar to those given to bifocal wearers;

(9) Warn of the possibility of frustration in the early stages due to the lack of progress and proper perception;

(10) Emphasize that tremendous patience and perseverance will be needed, particularly initially.

The author conducted a short experiement with low vision simulated by wearing glasses such that his normal vision was reduced to either 20/200 or 3/200 (with fields of 80° and 50° respectively). (Davidson: 1972) The results of that experiement are given here with the suggestio that the procedure of simulation could lead, not only to a more realistic appreciation of what low vision is, but also to the development of specific techniques of instruction for the low vision client. Without simulation, the instructior may not be aware that it may be possible for a person with 3/200 vision to pick up the change in color and form of a cross-walk signal (note: not legibility) at a distance of approximately 75'. Such findings have implications for training.

Situation	Detail	Conditions	Distance in ft	
			3/200 50°	20/200 80
1. Observing the presence of a moving car	Various cars and colors	Sunny with no shadow on road	180	1200+
2. Change of traffic light color	Overhead light in center of road	Traffic light lens in shade	100	450+
3. Color change of "Walk-Don't Walk" crosswalk signals	Average of viewing from a number of directions	Mainly sunny	75	200+
4. Legibility of "Walk-Don't Walk" crosswalk signals	Sufficient detail to show two distinct lines of letters	Mainly sunny	12	50
5. Reading street sign	3 1/2" x 1 1/2" black letters on white background 8' above ground	Bright shade	Not able to read	12
6. Observing obstruction-warning board (yellow)	40" x10" board with 7 3/4" black stripes	Bright overcast	40	200+
7. Distinguish blended drop-off; driveway intersecting sidewalk	Viewed walking 4' from and parallel to curb. Curb height; 7"; color:yellow	Sunny, with sun directly overhead	15	70
8. Recognition of presence of flight of steps	Steps in shade of entrance to building; brightly lit sidewalk at base	Bright sunny	15	60
9. Recognition of large familiar "Esso" advertising sign	Oval sign; red letters on white background	Bright		
10. Discriminate "Esso" sign as oval	As above	Bright	75	330+
11. Discriminate lettering on "Esso" sign	Approx. 2' x 1' capitals	Bright	25	180

Baumstark, Cathy
Carter, Kent
Coffin, Connie
Harriff, Bill
Mc Cullock, Ken
Orientation and Mobility Program
University of Northern Colorado
1973

"Developing a Mobility Evaluation Procedure for Low Vision Clients"

The authors propose to evaluate a series of test items specifically designed to give a quick, accurrate, easily administered test that determines both potential and functioning level in mobility of low vision clients. The test is divided into three areas: (1) static visual evaluation, (2) motion evaluation, and (3) auditory discrimination evaluation.

The static evaluation utilizes the keyston telebinocular. Cards have been developed from color photos of travel situations, i.e. drop-offs, obstacle detection, pedistrian traffic. Factors such as glare, depth perception, color and binocular vision may be evaluated using these cards.

Motion picture films are used to evaluate the low vision person's ability to detect movement patterns. Concepts to be tested include: convergence, divergence, collision, parallel movement, directionality of movement, and direction of deviation from straight-line travel.

Using taped sounds encountered in travel situations, an evaluation of the low vision person's potential and present ability to attend auditorily to his environment will be made by testing the following areas of auditory functioning: identification of sounds, tracking the path of sounds, and detection of masked sounds.

Item by item evaluation is proposed by setting up a standardized mobility route with scoring by mobility instructors. Those items from the three areas of evaluation showing significant (.05 level) comparison with similar items from the standardized mobility route will be retained. The final form of the evaluation should be organized so that interpretation of scores indicate strenghts, weaknesses, and specific areas of the individual being evaluated.

Coursey, Thomas et.al.
Orientation and Mobility
Specialist
Western Blind Rehabilitation
Center
VAH, Palo Alto, CA

"Night Viewing Goggles for Night-Blind Travelers" (written for Bull. Pros. Res., Spring 1972)

A pair of night viewing goggles, developed by a division of Intl. Telephone and Telegraph Corp. for military use, was tested on a single low vision person. On the basis of results obtained in this experiment, the researchers feel that with certain modifications, the goggles will prove invaluable for low vision night travelers whose rod vision has deteriorated.

The goggles consist of electronic wafers in combination with very specialized optics, and are mounted in a moulded plastic headset. The functioning of these goggles may be explained in a simplified manner: The scene being viewed is focused into the wafer by a series of lenses. At this point, the image is electronically converted to an electron image. This electron image is then amplified from the red and blue spectra to the green and yellow spectra. The resulting image is then mounted for viewing by means of a 180° twist in the fiberoptics. Finally, the image is viewed on the output window in much the same manner as one would view the image on a tv screen.

The subject used in the experiment has been diagnosed from birth as retinitis pigmentosa and is bilaterally aphakic. Last measurements for visual acuity and fields were 20/200 with a 4-5° field. Subject may be considered totally night blind as he is only able to see projected lights and is unable to detect curbs without use of a cane.

Testing of the instrument was ca-ried out in a rural-residential setting at 7:20 P.M. Light level was approximately 1 footcandle.

The first 20 minutes of the experiment involved static tasks. The subject was asked to describe various arm positions and count fingers of the experimenter on the other side of the street. Subject was able to distinguish detail of hand and count fingers with the hand held off to one side of the body or held in front of the chest.

During the latter part of the experiment, the subject walked along the road and described the environment (trees, fences, and a car parked at a distance of 15 yds.). A simple route was walked with the subject again visually detecting cars, trees, obstacles in his path, and intersecting sidewalks. On the return trip, using only his cane, he saw only projected lights and located his starting place by locating a landmark.

A comparison study was made of the same subject in daylight conditions. The subject was able to count fingers only with backgrounds of high contrast. Screening evaluation indoors with five additional subjects indicated potential benefits of the goggles as an aid for night blind travelers.

Editor's Note: The VA has recently purchased a monocular night viewing aid for further evaluation by the experimenters at the Western Blind Rehabilitation Center.

oore, Julia K.
rientation and Mobility Program
Florida State University
1973

"A Proposed Syllabus Guide for the Instruction of Orientation and Mobility for the Low Vision Student"

The author's review of literature cites the lack of appropriate classification of the low vision individual as a longstanding problem in the development of low vision programing.

Assessment and training programs for low vision are proposed, based on the utilization of low vision optical aids. Although the need for training and use of low vision is recognized, it is felt that there is insufficient information in the field about specific usage of aids, particularly for distance vision and mobility purposes. It is suggested that an interdisciplinary approach is the best means toward helping the low vision client.

Functional vision evaluation forms and a brief syllabus for mobility programs are included covering the following units: indoor, residential, and commercial.

Taylor, David E.
Major, Michael S.
Visual Disabilities Program
Florida State University
1973

"Factors for Consideration by Orientation and Mobility Instructor When Developing a Distance Low Vision Training Program" (summary of a talk presented at the 2nd Annual Southeastern Mobility Conference held at the Florida School for theDeaf and the Blind, Feb. 22-23, 1973.)

Orientation and Mobility specialists have perceived the need of developing a formal body of knowledge for use with low vision clients, similiar to that available in the university training programs relating to the totally blind.

Criteria for referral to mobility specialist for assessment of function travel vision are discussed. Dr. J. D. Newman, O.D.* has developed the following tentative set of such criteria:

Criteria for Automatic Referral of Low Vision Patients for Orientation and Mobility Evaluation

Visual Acuity (after best correction)	Lateral Peripheral Field (after best correction)
20/20	20
20/30	30
20/40	40
20/60	50
20/80	60
20/100	70
20/200	80
20/400	90
20/800	100

The initial stage of a low vision program is assessment, involving review of the client's ophthalmological reports, general physical conditio medications, audiological evaluation, and psychological assessment. The mobility specialist then conducts his own evaluation of functional vision including objective and subjective measurements. Visibility factors outlined by Apple and May (1971) and models of evaluation forms (Low Vision Abstracts, Fall 1972) should be reviewed preliminary to developing evaluation procedures for a low vision program.

In preparing for implementation of a low vision program, the mobility specialist can refer to two publications concerning program development: LaDuke and Blasch (1971), and Apple and May (1971) have produced guideline for setting up low vision training programs. The former employ operant conditioning and the latter, perceptual training.

The functional vision evaluation is an ongoing process. During the final evaluation, the instructor should strive to insure compliance with the visibility factors present in the assessment section of the low vision program for validity.

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*Dr. Newman would welcome reations and suggestions from members of the [illegible]ofessional community working with low vision clients: Dr. J.D. Newman, Northgate Shopping Center, Tampa, Florida.

FUNCTIONAL LOW VISION EVALUATION

The following are samples of functional vision evaluation forms developed and utilized at the Central Blind Rehabilitation Center, Veterans Administration Hospital, Hines, Illinois.

The evaluations are periodically checked and/or updated to insure that the staff are obtaining the necessary information about each patient's functional vision. All mobility evaluations (evaluation #2, #3, and #4) involve independent travel while locating various landmarks in the environment. They also incorporate visual interpretation and orientation to the environment.

SUMMARY - FUNCTIONAL VISION EVALUATION
SUMMARY - LOW VISION AIDS

NAME______________________________ AGE______ DATE__________

DIAGNOSIS:

ACUITY (year or more) O.S. ________ VF ________
O.D. ________ VF ________

ACUITY (current) O.S. ________ VF ________
O.D. ________ VF ________

PROGNOSIS: GOOD____ FAIR____ POOR____ UNCERTAIN____

HAS PATIENT NOTICED A DECREASE IN VISION? __________
IN PAST DAYS_____ WEEKS_____ MONTHS_____ YEAR_____

EDUCATION:

OCCUPATION (past or present):

HOBBIES, INTEREST, RECREATIONAL INTEREST:

PSYCHOLOGICAL:

FUTURE PLANS:

DOES PATIENT HAVE AID(S) AT PRESENT? _____
HOW OBTAINED?

WHAT POWER, OR REFRACTION IS AID?

CAN PATIENT READ WITH THIS AID? _____

THE PATIENT CAN READ ______________________________, _________ POINT,
AT A VIEWING DISTANCE OF _____ INCHES. HE READS WELL_____
FAIR_____ POORLY_____ WITH THIS AID.

THE PATIENT EXPRESSES A HIGH_____, MODERATE_____, LOW_____,
MOTIVATION FOR VISUAL IMPROVEMENT FOR READING_____, MOBILITY_____.

FUNCTIONAL VISION EVALUATION (near)
READING: (smallest print read)

JEAGER _____PT. ________________________ @ _____ INCHES O.S.
_____PT. ________________________ @ _____ INCHES O.D.

NVSC _____PT. ________________________ @ _____ INCHES O.S.
_____PT. ________________________ @ _____ INCHES O.D.

PLAYING CARDS: YES_____, NO_____ @ _____ INCHES (regular)
PLAYING CARDS: YES_____, NO_____ @ _____ INCHES (giant)

BEST ILLUMINATION ________________________ (light meter)

INTERPRETATION OF PICTURES AND PHOTOS: GOOD_____, FAIR_____, POOR_____

COLOR: GOOD_____, FAIR_____, POOR_____.

SIZE, SHAPE DISCRIMINATION: GOOD_____, FAIR_____, POOR_____.

TASK ORIENTED (explain):

FUNCTIONAL VISION EVALUATION (distant):
FIENBLOOM CHART: ACUITY O.S.___________
O.D.___________
O.U.___________

ILLUMINATION ON CHART: ________________________

MOBILITY:
IDENTIFICATION, DESCRIPTION OF OBJECTS IN ROOM:
(include distance, how illuminated, light meter reading)

SEARCHING OUT, IDENTIFYING OBJECTS IN OUTDOOR TRAVEL SITUATIONS:
(include average viewing distance, type of day, illumination)

PATIENT IS_____, IS NOT_____ AFFECTED BY CHANGES IN LIGHT.
EXPLAIN:

TRAVEL ABILITY:
EXPLAIN:
POISE AND GAIT:

AVOIDENCE OF MOVING AND STATIONARY OBJECTS:

PICK UP CURBS AND CROSS STREETS:

SCANNING:

NIGHT VISION AND TRAVEL ABILITY: (consider above points)

RECOMMENDATIONS FOR PROGRAM:

STAFF MEETING - SUMMARY OF FUNCTIONAL VISION EVALUATION: DATE________

PATIENT WAS SEEN BY OPTOMETRIST______, OPHTHALMOLOGIST______.

DATE______________
RECOMMENDATION OR COMMENTS:

DATE______________
RECOMMENDATION OR COMMENTS:

DATE______________
RECOMMENDATION OR COMMENTS:

ACUITY AND FIELDS AS DETERMINED BY LOW VISION OPHTHALMOLOGIST OR OPTOMETRIST.

ACUITY O.S.________________________ VF ________________________
O.D.________________________ VF ________________________

AID(S) PRESCRIBED ____
____
____
____
____
____

WAS TRAINING WITH THE AID RECOMMENDED? ____________
TYPE:

ACUITY (corrected) O.S. ________________
O.D. ________________

TYPE OF CORRECTION (Rx) ____ O.S.
____ O.D.

REFRACTION ORDERED:

DATE ORDERED______________________
PATIENT'S REGIONAL OFFICE:

TRAINING WITH NEAR VISION AID(S)

FOR EACH AID:
1. Type and power (X)
2. Smallest print read by point and type of material
3. Viewing distance
4. difficulty
5. maximum time pateint could read with the aid(s)
6. Write with aid
7. Reading test giving wpm, point and type, distance, and comprehension.

CLOSED CIRCUIT T.V. READER (C.C.T.V.)

TYPE OF C.C.T.V. ____

MONITOR: ____________

POINT SIZE, TYPE OF MATERIAL READ, AND MAGNIFICATION NEEDED:
(Include variation of working distances from monitor.)

THE PATIENT WAS ABLE TO READ PRINT OF __________________________
EASILY AND WITHOUT DIFFICULTY.

THE PATIENT WAS ABLE TO READ _____ WORDS PER MINUTE, AND _____%
FASTER WITH C.C.T.V., THAN WITH BEST HANDHELD OR HEADBORN AID.

THE PATIENT WAS ABLE TO READ _____ CONSECUTIVE MINUTES WITH C.C.T.V.,
AND _____% LONGER, THAN WITH BEST HANDHELD OR HEADBORN AID.

THE PATIENT WAS ABLE TO ____, WAS NOT ABLE____ TO WRITE LEGIBLY
WITH C.C.T.V.

THE VETERAN WAS ABLE TO OPERATE THE DEVICE____(yes), ____(no).
COULD HE ADJUST CHANGE OF FOCUS______, MAGNIFICATION_______,
CHANGE POLARITY ________?

ON TIMED TEST, THE PATIENT READ ______ WORDS IN _____ MINUTES.
TEST WAS _____ POINT TYPE.
COMPREHENSION WAS GOOD____, FAIR____, POOR____.

WAS C.C.T.V. RECOMMENDED? _________

HOW MUCH TIME SPENT TRAINING ON C.C.T.V.? ________

HOW DID C.C.T.V. COMPARE WITH BEST HANDHELD, OR HEADBORN AID?

TRAINING WITH DISTANT AID(S)

FOR EACH AID:
1. Type and power (X)
2. How was aid used (mobility, recreational)
3. Time training with aid(s).

FINAL RECOMMENDATIONS AND ORDER OF LOW VISION AIDS:

** If special training in the use of residual vision, or adaptive training with aids or Rx lenses was done, discuss on back of this form.

FUNCTIONAL VISION EVALUATION . DISTANT VISION - TEST AREA #1

PATIENTS NAME______________________ DATE______________

TEST ITEMS	24'	12'	f/c ILLUM.	-10'	f/c ILLUM.	COLOR	DETAIL
LARGE YELLOW SIGN (YIELD)			50		70		
LOUNGE CHAIR			50		70		
STAND ASHTRAY			50		70		
RUG			--		--		
TABLE			70		80		
RADIO			70		80		
ASHTRAY			70		80		
MAGAZINE			70		80		
LAMP			70		80		
FLOWERS/VASE			70		80		
LOUNGE CHAIR			80		50		
STREET SIGN			80		50		
STOP SIGN			80		80		
DESK			100		150		
CHAIR			100		150		
PHONE (D)			100		150		
PHONE (B)			100		150		
BOOK			100		150		
CLOCK			100		150		
WASTEBASKET			100		65		
ONE-WAY SIGN			90		70		
SMALL YELLOW YIELD SIGN			100		100		

STAIRS WEST END DIST. TRAVEL 30 fc illumination.

x Illumination at 24' is from 50-60 fc.

STANDARD ( ) ADAPTIVE ( ) See procedure for explanation.

FUNCTIONAL VISION EVALUATION DISTANT - MOVING TEST AREA #2

PATIENTS NAME ______________________ DATE ____________

OBJECTIVES	DIST.	EXCEL.	GOOD	FAIR	POOR	f/c ILLUM.
BRS TO LOBBY "F"					BLDG.200	8-32
POISE AND GAIT						
HEAD, EYE SCANNING						
OBJECT AVOID (M)						
OBJECT AVOID (S)						
PHONES						20
COKE MACHINE						20
NEWSPAPER MACHINE						20
WEST CORRIDOR BLDG. 1						16-65
CANTEEN SIGN						16
LIBRARY						18
LOBBY "D" (ENTRANCE FROM WEST)						48.5
POISE AND GAIT						
HEAD, EYE SCANNING						
OBJECT AVOID (M)						
OBJECT AVOID (S)						
LOBBY "D"						
ELEVATOR						
N. OPENING TO EAST CORRIDOR						4
EAST CORRIDOR BLDG. 1						
POISE AND GAIT						
HEAD, EYE SCANNING						
OBJECT,AVOID (M)						
OBJECT AVOID (S)						

COMMENTS: ON BACK DISCUSS RETURN TRIP TO BRS, EFFECTS OF LIGHT CHANGES, IF ANY CORRECTIVE LENSES OR LVA'S USED.

LOW VISION PROGRAM
FUNCTIONAL VISION EVALUATION
TEST AREA #5

RESIDENTIAL AREA	-5'/+5' DISTANCE	RATING	8 POS. ID.	2 BL. ID.	1 NO ID.
CURBS					
STREET/INTERSECTION					
DRIVEWAYS/WALKS					
MOVING CARS					
HEAD LIGHTS					
TAIL LIGHTS					
(R) LINE PROJECTION					
(R) OBJECT AVOIDANCE (M)					
(R) OBJECT AVOIDANCE (S)					
(R) STREET CROSSINGS					
BUSINESS					
CURBS					
STREET/INTERSECTIONS					
DRIVEWAYS/WALKS					
SIGNAL LIGHTS					
RECOGNIZE DESTINATION					
MOVING CARS					
HEAD LIGHTS					
TAIL LIGHTS					
LOCATE CAR					
(R) LINE PROJECTION					
(R) OBJECT AVOIDANCE (M)					
(R) OBJECT AVOIDANCE (S)					
(R) STREET CROSSINGS					

Describe patient's poise and gait.

Was he able to avoid both moving and stationary objects?

Could he see the curbs, and how well did he handle street crossings?

How was he affected by the various lighting situations; dark, light in business area, street lights, or headlights of on-coming cars, etc.?

Additional comments:

Therapist____________________________

INTRODUCTION TO, AND EVALUATION OF DISTANT LOW VISION AIDS

TYPE/POWER	DIST. TARGET 6" x 28" 40' 4" LETTERS B/W	DIST. TARGET 20" DIA. 20' 3/4" LETTERS W/B 7/16" LETTERS W/B	DIST. TARGET 18"x24" 100 YARDS 5" LETTERS 5"x14" ARROW B/W
Patient's opinion of aid:			
Patient's opinion of aid:			
Patient's opinion of aid:			
Patient's opinion of aid:			
Patient's opinion of aid:			
Patient's opinion of aid:			
Patient's opinion of aid:			

RECOMMENDATION FOR LOW VISION DISTANT AID(S):

LETTER TO THE EDITOR:

In your LOW VISION ABSTRACTS, Vol. 1, No. 2, Spring 1972, your editorial took to task Orientation and Mobility Specialists, and especially their training institutions, for failing to develop competency in doing acuity and field testing. Your theme was that we (mobility specialists) are confused by low vision clients because the reports of acuity and field testing provided by the medical profession do not correlate to what we see in terms of performance. You suggest that we would be less confused if we did the testing ourselves. I question your theme and some of the supporting statements you made in that editorial.

It is true that mobility specialists have indicated that acuity and field test reports seem to be of limited value because experience with the client often shows a lack of correlation between test scores and functioning. Further, an explanation for this lack of correlation has been that the tests are sterile due to their clinical nature and that a functional evaluation must be devised to increase the understanding of how a low vision client will function. If this is true, then the transfer of the responsibility for carrying out standardized acuity and/or field tests from the ophthalmologist or optometrist to the mobility specialist will not provide new or more valid information. I submit that the standardized procedures of testing are not adequate for the purposes of the Orientation and Mobility Specialist.

You imply that the training institutions are remiss in not providing these skills because they consider the tasks involved to be the "Sacred Portals," of the medical profession. It was wrong of you to draw such a conclusion unless you have some valid information to support the accusation. If indeed they are remiss, I would suggest it is because they have not recognized a need to include that specific information. I doubt that concern about infringement upon another profession's realm of activity has been a barrier to developing curriculum content within any of the college/university programs.

I think your further comments lose credibility when you made generalizations without support. You stated that "most ophthalmologists have their secretaries or nurses take acuities and field." I simply don't believe any study exists to substantiate that statement. If you can document it, you should have done so. If not, it should have been expressed as an opinion, not a statement of fact. Personally, I suspect you are right about acuity testing, but very much doubt that field tests are given by secretaries and/or nurses. That is an opinion, of course.

You asked if you made your point about secretaries doing testing in different offices with different lighting. I would say no, your point is not made. I assume you are alluding to the effect of varying lighting conditions upon test results. However, this would equally be true if I were doing the test, that is, if I used the same test equipment and procedure as done by the secretaries. I remind you, that is what you have suggested. You did not suggest a new approach is needed to evaluate low vision. If indeed the problem is simply the lack of reference to varying lighting in the test procedure, then the mobility specialist could work to educate or insist to the medical profession that these factors be considered in the testing procedure. Lighting is not the singular problem with present testing techniques, and changing the lighting in a room will probably not substantially increase our understanding of how a client may function in daily activities.

You similarly point to possible discrepancies in how field tests are done by the medical person or his assistants. Again, if the mobility specialist takes on the task and uses these same clinical test procedures, we will still not know how the client might use his fields of vision in functional activities. Rather than training the mobility specialist to use inadequate testing methods, new methods need to be developed. Whether the mobility specialist training institutions should or could be the developers of such methods would be another topic area.

I do not wish to be redundant, but you continued to support the theme stating that the mobility specialist should pursue the development of skill in using materials such as the Feinbloom Low Vision Test Chart or the Sloan Near Vision Reading Cards, that he locate an interested ophthalmologist or optometrist to teach him testing techniques and that this would enable him to make better judgments about the performance of his clients.

I repeat that I question this thesis. Will the application of standard test materials and techniques tell the mobility specialist what he needs to know? I doubt it. I believe these tests, even when carried out with care and frame of reference of the mobility specialist will provide very limited information about "performance" of a client. A more fruitful evaluation procedures which involve performance activities in a range of environments and under varying conditions.

Sincerely,

ROBERT A. EISENBERG, Director
Orientation and Mobility Training
Department of Special Education
Calif. State University, Los Angeles

EDITORIAL

Subscription policy changed!!!

The Low Vision Abstracts will be sent free of charge to any individual requesting to be placed on the mailing list. This is a change from the policy of sending it only to those who had submitted papers. The Abstracts will continue to be directed toward information on the uses of distance vision. The availability of the Low Vision Abstracts was announced in the March, 1973 issue of Long Cane News.

Submissions welcome!!!

The reading audience of the Abstracts includes a great many disciplines interested in low vision, perception, and mobility. We hope that they will begin to share their rich experience with the Abstracts and its other readers. Because the unmet needs in low vision are so great, they provide a common exchange point for all of us. Everyone has something to say about low vision: obervations, case studies, reports on special techniques, and reactions to Abstracts articles.

SUGGESTED RESEARCH TOPICS

1. Compare the night-time travel performance with long cane and with flashlight of a low vision person who is night blind.
2. Prepare case studies, with observations and interviews, on the night-time mobility of low vision persons who are night blind.
4. Prepare case studies, through observation and interview, on the night-time travel of low vision persons whose visual defect is a central scotoma, and who are not "night blind."

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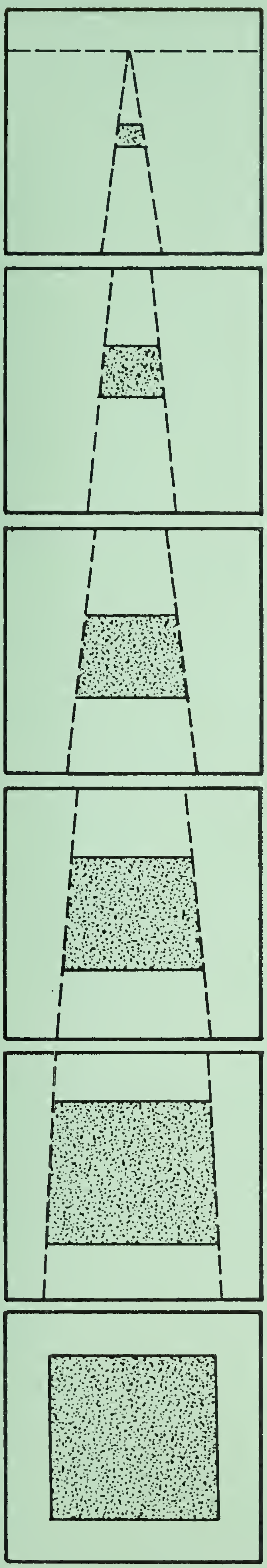

LOW VISION ABSTRACTS

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LOW VISION ABSTRACTS

Fall 1973 Vol. 1 No. 5

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CONTENTS

FEATURE ARTICLES

A Survey of Developments in a New Field: Orientation and Mobility for the low vision person. Part III. Perceptual Training, orientation & mobility and conclusion.
Terry Davidson.......... 1
Subjective Field Examinations in Low Vision Evaluation.
Marianne May Apple...... 9

ABSTRACTS

A study of low visual acuity and reduced fields in a residential home for the elderly......14

Low Vision and Curb Detection..................15

EDITORIAL....................16

SUGGESTED RESEARCH TOPICS....17

LETTERS TO THE EDITOR........19

CURRENT BIBLIOGRAPHY.........23

A SURVEY OF DEVELOPMENTS IN A NEW FIELD: ORIENTATION AND MOBILITY FOR THE LOW VISION PERSON*

Part III

Perceptual Training, Orientation and Mobility Training, and Conclusions

By Terry Davidson
Doctural Student
Dept. of Special Education and Rehabilitation
University of Pittsburg

PERCEPTUAL TRAINING

Barraga's research has stimulated much interest in the utilization of low vision but this has been for near vision rather than distance vision and it is the latter that is of interest for the O&M specialist. Apple (Palo Alto V.A.), Hill (Florida State) and Specht (Community Services for the Blind, Seattle) are the only people known to have written about work in the area of distance perceptual training.

Specht's program is said to be designed around the phases suggested by Frosting but no further detailed information could be obtained.

Hill (1971) has outlined a three phase program in which the first stage is the development of a vision evaluation system. The second phase will comprise the development of individual training programs in the areas of distance vision and spatial concepts and this phase will be based on the results of the phase I evaluation. The perceptual training program is said to be the same as Apple's (q.v.) except for the "added dimension of spatial conceptual assessment and training".

Apple & May (1971) have described a perceptual training program in _Distance vision and perceptual training_ but there has been (as far as is known) no implementation of such a training program in the actual training of low vision persons. The program described by Apple is theoretically based, and the outline of the nine sections is included in this paper. As described in the book, there are many aspects of training that are so generalized that they can be of little help to the practicing O&M specialist and only those techniques that could be easily understood and applied have been included in this paper to illustrate the potential that this appreach has; three techniques fall mainly into one section (Section G). The reader is referred to the original text for the full details of Apple's approach.

The nine sections of training are as follows:

(A) Fixation of distant objects

(B) Pursuit -- involving movement of eyes, head and body

(C) Accomodative accuracy and facility

(D) Adaption

(E) Visual perception and visual recognition of form

(F) Visual recall of form

(G) Visual perception of space and direction

(H) Visual monitoring of body movement

(I) Ability to process information from wide area in minimal time.

Under E. (Visual perception and recognition of form), it is suggested that the client distinguish hue areas and try to discriminate between automobiles in a parking lot. In F. (Visual recall of form), it is suggested that the instructor endeavor to develop in the client a sense of reward in the use of distance vision. Activities suggested are the viewing of events not critical to mobility (e.g. recreational events) and the giving of visual information that cannot be seen by the client. The latter activity is designed to stimulate curiosity and interest. For G. (Visual perception of space and direction), a larger number of activities are suggested:

(i) the instructor develops a visible guideline in the form of a painted line, tape or rope on the floor, at waist or head level and asks the client to walk parallel to it at different distances from it;

(ii) a number of targets are set up (in line first, then zig-zag) and the client moves between them, The distances separating the targets are gradually increased;

(iii) a "follow-the-leader" type activity in which the client follows the instructor at gradually increasing separations;

(iv) the client is stationary and tries to judge the nearer of two people who are walking along parallel lines;

(v) the client is brought through routes of increasing visual and geographic complexity and, on completion, attempts to sketch the route.

ORIENTATION AND MOBILITY TRAINING

The travel training program at the West Virginia Rehabilitation Center is divided into two sections -- residential and business --

and records from that agency show that four students spent 70, 47, 46 and 36 hours each in completing the program up to the level of "metropolitan travel". Another student spent 26 hours reaching the level of "medium business travel". The student requiring 70 hours had had education to the 3rd. grade while the remaining students were 7th to 12th- grade level. Concerning the time involved in an O&M program for the low vision student, Mr. Michael Major of the Maryland School for the Blind, writes: "At present I have one (student integrated into a formal program) three times weekly (40 minute sessions). He has completed 51 lessons, and should complete a program within 60 lessons, vs. approximately 200 lessons for a totally, congenitally blind child. This student's extreme reclusiveness and lack of independence motivation have slowed progress where another child might already have finished (personal correspondence)". The syllabus of the Missouri School for the Blind indicates that most of the students should complete all phases of the Partially Seeing Unit in 25 hours and at the Onondaga Lighthouse (Syracuse), the full program consists of 20 lessons. From the above information, it seems reasonable to assume that an average student should complete a low vision mobility program in approximately 30-50 hours.

Four examples of O&M training as applied to the low vision client are now presented and these have been condensed for the purposes of this paper by removing references to particular streets and local information which could be of no help to the general reader.

The Maryland School for the Blind describes six basic lessons:

Lesson One.	Basic orientation. Sighted guide, compass directions, campus familiarization and drop-off.
Lesson Two.	Traffic lights, traffic patterns, street crossings identification of signs.
Lesson Three.	Drop-off lesson. Destination. Making a purchase, location of a parked car.
Lesson Four.	7 block route. Compass directions, street crossings.
Lesson Five.	Bus trip. Ability to ask questions.
Lesson Six.	Repeat of Lesson Two at night.

West Virginia has the following program:

1. Residential Travel

    a. Using different shades in travel situations
    b. Practicing elementary safety procedures

c. Learning street layout orientation
d. Using compass direction
e. Scanning with limited visual field
f. Recognizing landmarks and objectives using limited vision
g. Crossing non-traffic signal controlled intersections using limited vision and traffic cues

2/ Business Area

a. Distinguish differences in store fronts (shape, color, etc.)
b. Crossing signal controlled intersections utilizing limited vision and traffic cues
c. Shopping for store items and making a purchase using limited vision
d. Location of specific business objectives
e. Traveling on public transportation
f. Locating objectives in unfamiliar areas with only verbal instructions
g. Planning independent routes of travel
h. Drop-offs.

At the Onondaga Lighthouse (Syracuse), the O&M service assumes the responsibility for the fitting of a low vision distance lens and training the individual in the use of that lens. Their program is quite detailed but the basic structure is:

Lessons 1-4	Locating street signs
Lessons 5	Following route and reading street signs
Lessons 6-7	Drop-off lesson necessitating use of low vision aid
Lesson 8-12	House numbering, locating addresses, room numbers
Lessons 13-18	Locating buildings and stores from signs
Lessons 19-20	Location of bus stop signs, locating and reading of bus destination signs (including instruction on how to locate and read the destination on the approaching bus).

Since 1969, the Missouri School for the Blind has included a unit for the partially seeing in its syllabus guide and the student, on completion of the unit, is entitled to the fifth Orientation and Mobility Certificate and a gray Mobility Pass which will allow him to travel in any area independently. Introduced at the 6th grade, the unit endeavors to teach effective use of vision through the use of low vision aids, the other senses and pre-cane or cane techniques.

The program consists of:

A. Sighted guide
B. Self-familiarization skills
C. Sensory training: including use of low vision aids; identification and localization of sounds; identification of odors, tastes etc.; muscle memory and judging of distances
D. Concepts: size, direction, time, street patterns
E. Numbering systems
F. Soliciting aid: when, how, kind
G. Evaluation (see earlier Section)
H. Five pre-determined runs:
    1. In school building
    2. A day and night lesson in residential area after different kinds of familiarization
    3. A day and night lesson in residential areas with no previous familiarization
    4. A day and night lesson in business area with and without previous familiarization
    5. A day and night lesson involving the use of public transportation and soliciting aid

Conclusion

This paper has attempted to bring together, perhaps for the first time, some details of various aspects of O&M for the low vision person -- a topic in which there has been growing interest over the past decade. At this time, the O&M specialist is trained essentially in the techniques for the totally blind; it seems apparent that there is a need for training to expand past this into the fields of optics and visual perception in order to provide optimum services for the low vision client.

While this paper outlines some of the research trends concerning functional vision evaluation and actual programs of evaluation and training, it can be seen that if specific instructional techniques have, in fact, been developed then these have yet to be written down in usable form. The generality of present descriptions is only too obvious.

This author envisages a university training program which would, first of all, train the O&M specialist as is now being done at the university level; this will be advisable since he then has the capability of instructing the totally blind and, where necessary, the low vision person. The latter may require the cane only in certain situations (e.g. night time) or for certain visual conditions (e.g. extremely marginal functional vision).

Over and above this training, the O&M specialist in low vision would:

(1) investigate the psychology of disability in some detail -- in its relation to overall adjustment and in particular reference to the use of optical aids, identifying symbols (i.e. use of the cane) and in the soliciting of aid. Some individual or group counseling experience along the lines suggested by Mehr, Mehr and Ault (1970) would constitute a related part of his preparation.

(2) become familiar with the most recent methods of evaluation of functional vision in both the clinic and in the natural outdoor setting. This would necessitate knowledge of the effects of variables such as light intensity, glare, contrast and the devlopment of specific standardized criteria that the evaluator can use in actual practical evaluations. Experience and knowledge in how a low vision client may estimate factors such as depth perception and scanning could also be incorporated here.

(3) be able to apply appropriate methods of perceptual training that may have been developed at that time e.g. training procedures for all nine sections delineated by Apple & May (1971).

(4) be conversant with basic optics and the variety and application of low vision aids. This knowledge would be at a level such that the O&M specialist could converse professionally with the low vision clinic optometrist so that the technical content would not have to be put into layman's language or glossed over. By such training, it is not intended that the O&M specialist should replace the vision specialist but rather, to augment the function of the latter by being able to provide relevant feedback and reasoned recommendations for changes.

(5) be conversant with specific methods in training a person how to use a particular aid. The use of simulated low vision during training may well provide the basis for the development of appropriate techniques, especially when combined with practicum type experiences with low vision persons during his training period.

(6) be able to develop appropriate course outlines and lessons for training clients with a wide variety of visual impairments.

It seems clear to this author that this additional work is not just a small "extra" to be tacked on to the existing O&M university program -- the development of professional expertise in these six above mentioned areas would be quite demanding. An extension of time in training would be one possibility while another approach may be substitute these new areas for courses which are now thought to be essential content.

Development of the suggestion for expanded and specialized training hinges on the work of those now in the profession -- much definitive research and program development being needed in all the areas mentioned in this paper. If this paper will act as a spur for further specialization through providing a general picture of what is now being done in this field, then its purpose will have been met.

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SUBJECTIVE FIELD EXAMINATIONS IN LOW VISION EVALUATION

BY

Marianne May Apple

The need for tools to assess functional low vision for distance vision purposes requires flexible attitudes towards the standard measures of vision evaluation, and creation of new techniques for understanding the visual experiences of the client. It is hoped that the mobility specialist will begin to view acuity and fields work in the mobility curriculum less as a clinical tool or instrument for measurement, and more as an implement for understanding low vision functioning. Following are suggestions for the mobility specialist in utilizing clinical acuity and perimetric measures. Their implicit concepts may expand his approach beyond deliniation of the client's low vision and facilitate comprehension of the functional vision and effective rehabilitative effort.

The discussion of these concepts for use of acuity and perimetric measures by the mobility specialist is followed by description of a new technique which may be used in conjunction with all other functional vision evaluation procedures. This technique, subjective field examination was first introduced (Apple & May, p. 11) as a component of assessment of severely impaired visual perception based on potential for learning and development rather than on the limitations of the defective organ founded on a model of normal vision. During the period in which subjective field examinations were a standard procedure for low vision evaluation at the Western Blind Rehab Center, VAH, Palo Alto, Calif., the nature of information obtained from this procedure was found a useful tool in gaining improved understanding of low vision on the part of the low vision specialist, and self-perception by the client.

ACUITY AND VISUAL FIELD MEASUREMENT IN THE MOBILITY CURRICULUM AND PRACTICE

Acuity and perimetric measures are generally introduced at some point in the programs training mobility specialists to provide familiarization with optometric and ophthalmic terminology as it relates to a client's records. Some graduate mobility programs have begun to educate students in actual clinical procedures. Such study does provide a vocabulary with which the mobility specialist should be familiar in order to interpret reports or confer with related professionals on an equal bsis. The team approach is becoming a popular concept in low vision rehabilitation, and the optometrists and ophthalmologists should not have to talk down to the mobility specialist.

Clinical acuity and fields work provide the opportunity to observe visibility factors and their relation to low vision functioning under controlled conditions. The mobility specialist may gain practice in manipulating brightness-contrast, brightness-level, size, color, etc. in the clinic. This type of practice and the perceptivity it brings will aid the specialist when he begins to think about setting up functional vision evaluations and training procedures.

Thinking less in terms of the Snellen chart or Landolt C, and more in terms of visual angle upon which these measures are based is a practical approach for the mobility professional. Visual angle is applicable to the outdoors in practical work. The instructor should be able to transfer the "seeable" enviroment of his client's acuity measurement to an outdoor environment of comparable visibility. Telephone poles and cars may become test objects.

When great variations in acuity are observed in the clinic depending on the degree of illumination, think beyond this artificial situation to the implications it has on the low vision client's travel in bright sunlight or at night. This applies equally to variations in the visual fields measurements.

Measurements obtained through acuity and field testing should not be imposed as limiations on your client's functioning. They aid in describing the conditions under which functioning may fluctuate and serve as a basis for initiating training. In the training program, seek to extend the conditions under which the client can function effectively, and increase the degree of efficiency at each level. It has already been shown that two clients with identical acuity measurements can function quite differently.

Perhaps the least important reason for the mobility specialist to learn acuity and perimetric measurements is to conduct this area of vision assessment independently of other eye care professionals. The mobility specialist has his work cut out for him without attempting to replace the eye care specialist. There may be occassions when the mobility specialist may need standardized reporting, or reports may not be available from another source, in which case the ability to conduct his own clinical measurements is an asset. The greatest value of acuity and perimetric measurement to the mobility specialist is as a tool to the understanding of severely impaired vision.

SUBJECTIVE FIELD EXAMINATIONS

Subjective examinations encompass three main areas of information: individual personal data on the client, visual anomalies, and approximations of subjective visual fields. (Apple & May, 1970). The interview and examination can be conducted along the following suggested outlines:

Subjective Complaints

Interview the client to confirm his medical history and determine what degree of insight and understanding he has of his eye condition and visual functioning. Questions may be directed to determine what use he has made of his vision prior to entering the graining program (ie. travels independently, does household work, is employed, watches TV, reads, participates in sports); what he would like to be able to use his vision for after training; and what hopes the client has for improvement or return of vision.

Ask the client to describe subjectively his vision. This description may elicit responses such as "like looking through wax paper," "Like looking into a tunnel with scenery on the sides", "jumping or wrinkling of images", "like looking through a straw in the fog".

Question the client to determine if he feels one eye functions better than the other. More weight may be given by the client to the value of poor acuity in one eye which has a larger visual field. Is his vision better at one time of the day; under what conditions does his vision appear to function better or worse (ie. in poor illumination, when rested, depending on level of blood sugar)? If he uses his vision for reading or other visual tasks, for what length of time can he do so comfortably?

Light adaption problems and night vision functioning are the next areas of probing. What does he do to counteract discomfort caused by light or temporary blindness created by brihgt lights at night?

Question the client regarding phosphenes or similiar phenomena including detail on color of phosphenes under what sort of conditions they occur (ie. coming into bright light, when fatigued) and duration of these phenomena. Obtain information on floaters with similiar detail. It is also suggested these phenomena be explained to the client in terms of their occurance in normal visual functioning and some of the things which create this phenomena.

Obtain information on types of primary visual stimuli perceived and util utilized by the client (ie. light, contrast, color, hue areas, glare areas). When he wants to see something, what methods does he use to be able to see it (scanning, blinking, preferred viewing distance, monocularly binoculary)?

Perception of Colors

Ask the client which colors he can see best, and which are the most difficult to accurately perceive. If color perception is very poor, what cues does he use to guess at colors? A standard color vision test or chart such as the Farnsworth Munsell 100 hue test, as well as a description of various colors in the room may be used to judge the accuracy of his perception of this area of visual functioning.

Fluctuation, Extinction, and Completion

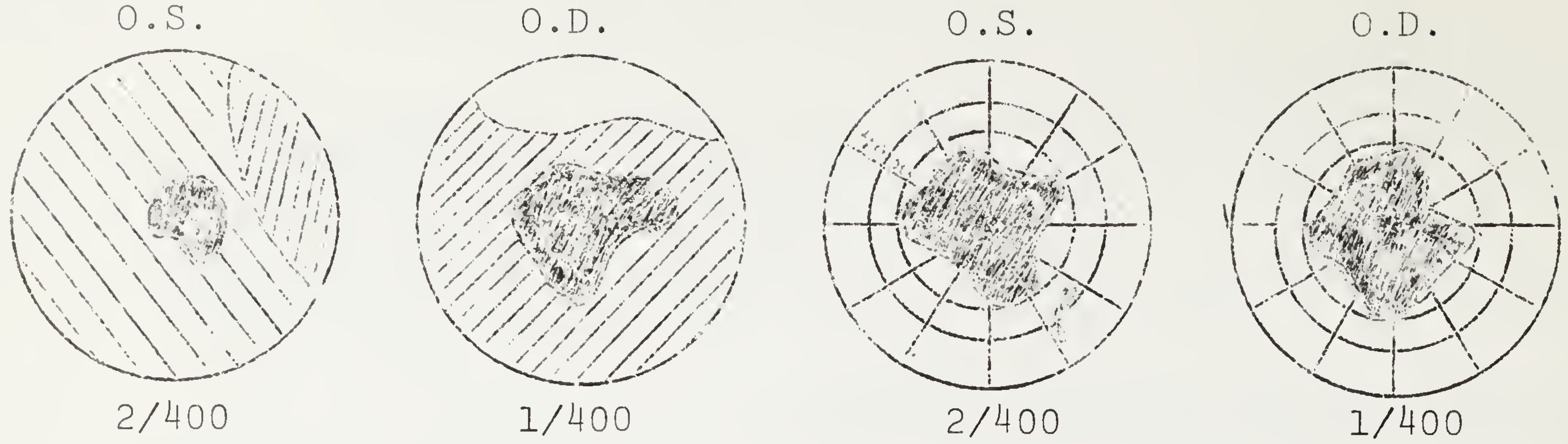
Ask the client if objects seem to fade in and out in clarity when he stares at them, or if they completely disapear. If there is extinction, what does he do to combat it and keep the visual image fresh (ie. blink, or look away)? Does extinction appear to be related to photophobia, retinal fatigue, or general ocular fatigue?

Scanning

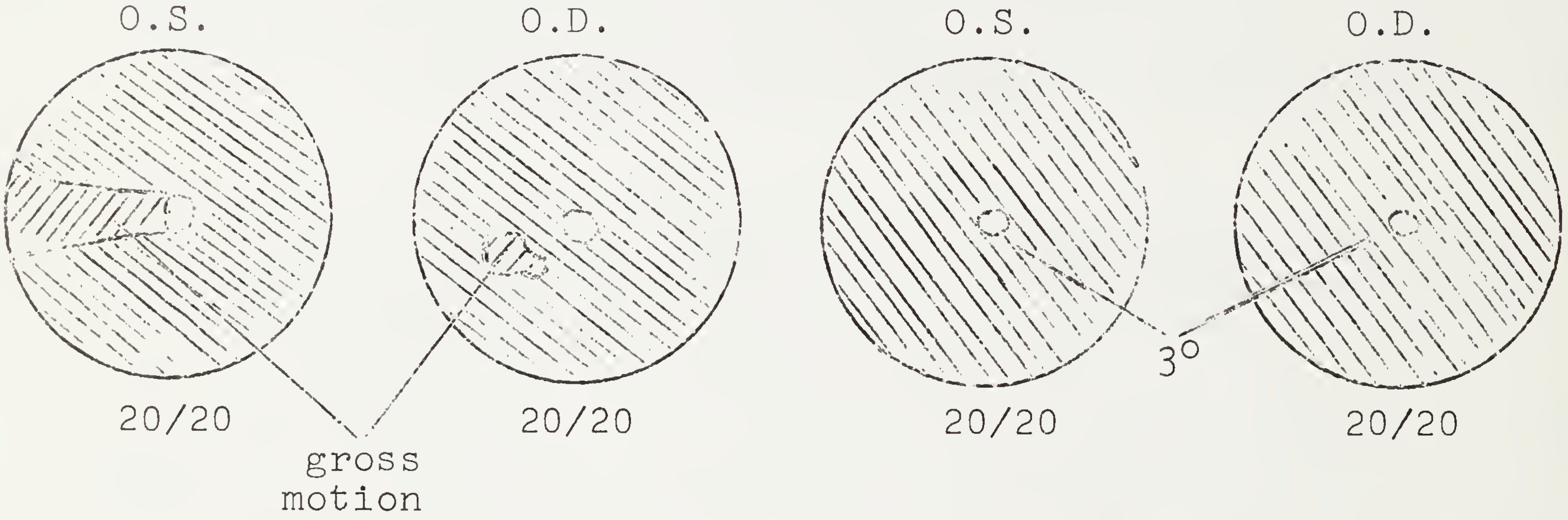
Place a tray containing seven or eight small objects (key, penny, scissors, stamps, rubberband, piece of gum etc.) in front of the client and ask him to get as close as he wishes to the objects without touching them, and to count the number of objects he sees. Then ask him to describe or name if possible, the objects on the tray. Observe the distance at which he views the objects and his method of scanning if scanning is employed (ie. systematic pattern, eye movement, head movement or body movement type scanning). Observe to note if a portion of the field seems neglected and objects pass unnoticed. Repeat with distance vision task, such as a poster on the wall.

Subjective Field Drawing

Ask the client to draw or indicate as best he can what his field of vision is like as experienced by him. Subjects with good figure-ground discrimination may draw fields on a sheet of white paper with a circle drawn on it with a felt pen. Subjects with severely reduced acuity or poor figure-ground discrimination may use a white cardboard circle and black felt pen. He should be cautioned not to draw fields which may have been indicated by his ophthalmologist, but as he experiences them himself. He may indicate blurred areas, areas of no vision, floaters or spots, cobwebs of blood, pools of blood, wrinkles, areas of distortions, etc. Draw one eye at a time, occulding the other eye. He may also indicate areas of perception of light or motion only. The following are illustrations of subjective field drawings obtained among the student population at the WBRC. The perimetric measures for these same individuals are given as a comparison.



MACULAR DEGENERATION



INCONGROUS HOMONYMOUS HEMIANOPSIA

Clock Test

Following the subjective field drawing, ask the client to draw in hands of a clock to indicate specified times. The task is done monocularly and the requested times should correspond to areas of possible field defects. Note if the client seems to displace hands or avoid certain parts of the clock face. Is there any relationship between neglected areas of the clock face and visual field defects?

Binocularly, have the client find the center of a large circle and then draw in numerals to transform the circle into a clock face. Can he find the center of the circle? Are the numerals displaced in any direction?

Discrimination of Size and Length

Ask the client to make judgments of relative size of similiar objects. Three by five index cards with circles and squares of comparative size and color may be used. He should be asked to group the cards according to size of form, regardless of color and form. Note how he goes about grouping the cards and comparing the cards.

Can the client distinguish difference in length of two lines not drawn parallel or close to each other?

Visual retentiveness

Flash3x5 inch cards with red and black circles arranged on them containing from two to five forms per card grouped in various patterns. Ask him to judge how many circles are on each card.

Depth perception

Ask the client to take hold of an object held in front of him. Does he group for the object or can he grasp it? Does he accurately localize the object seen in space if it is not in the central field? Can he recognize or correctly determine the relative positions of objects within the field of vision? Which of two objects is closer to him that are placed 10-15 cm apart at a distance of 1/2 meter from him?

These procedures may reveal visual anomalies which do not appear in the usual examination approaches. The subjective field exam allows more useful interpretation of such anomalies. Additional procedures can be found in the literature (Williams & Gessel), 1962; Bender & Teuber, 1948; and Newcombe, 1969). These might include such areas as eye and hand orientation tests, modified Benton visual retention test, near-to-far and far-to-near fixation tests, etc. No claims are made for the objectivity of the procedures which have been described. The author has found them useful in gaining additional insight into the functioning of severally impaired vision.

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Dosch, Thomas G.
Orientation and Mobility
Program
Western Michigan University
1973

"A study of low visual acuity
and reduced fields in a
residential home for the
elderly"

An increase in the proportion of legally blind among the aged raises the question of adequacy of visual services to this population. The author cites references on some of the problems of the aged related to blindness. Residents of nursing care facilities, for example, are frequently classified as non-ambulatory on the basis of visual impairment. Lack of early diagnosis and treatment of eye problems resulting in blindness is another cause for concern.

Results of visual screening for distance and near acuity and visual fields of a representative population of residents of a home for the aged (28 subjects) showed the need for visual services at every level for the aging. The span of time between eye exams showed a sharp increase with age. The time between replacement of eyeglasses also increases with age. Over 51% of the subjects' glasses were in need of adjustment or repair. The percentage of glasses in need of adjustment or repair increased sharply with increase in length of time since last exam. Age was a major factor in the amount of vision with correction remaining to the person. Interestingly, 18.5% performed better in the screening without their present correction. The difficulty in obtaining visual fields on all subjects suggests the need for development of visual field screening procedures for use with geriatric persons. 37% of those for whom measurements were obtained had field losses.

A complete list of all equipment used by the author for visual screening is included.

Kevorkian, Gregory A.
Orientation and Mobility Program
Western Michigan University
1973

"Low Vision and
Curb Detection"

Information on observations of curb detection by several low vision persons of different eye pathologies under varying conditions of illumination is presented in this paper. An attempt was made to determine if there are any similarities in the manner in which different pathologies detect and negotiate curbs. The pathologies used are Retrolental Fibroplasia, Choroideremia, Vascular Pathology (Hemianopsia) caused by stroke, Retenitis Pigmentosa and Glaucoma. The observations describe the walking surface used, use of cane, if any, tentative identification, speed and manner of approach, head scan, and comments that have been offered by the client under study.

There was a marked difference in all levels of functioning between all the etiologies. Light level affected some subjects more than others in a predictable manner. All subjects used enviromental cues to locate the curb. There was a marked difference in head scans between field losses and acuity losses. The field loss subjects showed a decrease in speed during an approach, which acuity loss subjects did not. This was due to their need to scan the area to locate the curb.

The author concludes that all estimates of visual function and instruction have to be arrived at by individual functional testing of each low vision person. A general program cannot be devised for instructing low vision persons.

EDITORIAL

Stimulating and rewarding are the only words for many of the papers submitted to Low Vision Abstracts by graduate and undergraduate Mobility Specialists. These articles are adding steadily to the fund of information about low vision and its effects on mobility and other aspects of behavior.

Most of the articles submitted are abstracted and published. There is one kind of paper upon which we would like to make some suggestions. These are the papers designed to be reviews of the literature or treatises based on library research. Students are inhibiting themselves if they restrict the number of publications which they explore for their source documentation to those on "low vision." Too few papers show any work done outside the narrow bounds of the Blindianna reference files.

There exists in medicine, psychology, neurology, optometry, optics, and engineering a great deal of information about vision and visual functioning which is not being related to the needs of low vision persons in mobility. There are keys to this information in indices in the forms of card files or catalogues, and information retrieval systems.

VISION INDEX, issued quarterly in catalogue form, with annual cumulation, is an author/subject index generated from the data base of the Visual Science Information Center.

The Visual Science Information Center is a specialiced information center covering the subject of vision. Its' bibliographic information services are available to the public. Request for bibliographic information should be addressed to:

Visual Science Information Center
University of California
Berkeley, California 94720
(415) 642-4647

INDEX MEDICUS indexes articles from approximately 2,300 of the world's biomedical journals. The computerized system is referred to as MEDLARS (Medical Literature Analysis and Retrieval System).

INDEX MEDICUS is issued monthly and cumulated yearly. Each issue includes an author index and subject index, and a list of journals indexed is included in the January issues of the cumulated issues. This is available in most college libraries.

SUGGESTED RESEARCH TOPICS

1. Develop a Thurston type scale which will describe the orientation and mobility performance of a low vision individual utilizing night vision.

2. Develop a Gutmann type scale which will describe the orientation and mobility performance of a low vision individual utilizing night vision.

3. Develop a Likert type scale which will describe the orientation and mobility performance of a low vision individual utilizing night vision.

LETTERS TO THE EDITOR

To the Editor:

There apparently has been a lack of communication about the use of our evaluations. Let us hope that communication in the future will be more open.

We would appreciate an editor's note stating that there was a misunderstanding about your use of our Functional Vision Evaluations and that those evaluations were incomplete, in that explanations were not included. Also in the next edition, the developers of the evaluations should be given credit. Furthermore, we would like the enclosed materials published, in full without changes.

We appreciate your cooperation and efforts in rectifying this error. Continued success with the Low Vision Abstracts.

Sincerely yours,

Dee Quillman
Low Vision Specialist

Leon Haith
Low Vision Specialist

Central Blind Rehab Center
VA Hospital
Hines, Ill.

Ed. note:

The editors indeed regret that the inclusion of samples of functional vision evaluation forms (Low Vision Abstracts, Fall 1973, Vol. 1 No. 4, pp. 16-26) caused a misunderstanding between the editors and Mr. Quillman and Mr. Haith.

Materials on functional vision evaluation were solicited and received from the Central Rehab Center for possible inclusion in Low Vision Abstracts. Materials so received are abstracted or condensed at the editors' discretion if the decision is made to publish them. In the case of evaluation forms in particular, space does not permit publishing of the complete battery, so representative samples are selected for publication. Articles written expressly for LVA by a contributing editor, or a student research effort of unusual merit are published in full.

The editors did not intend to convey the impresssion that the sample forms found on pp 16-26 of spring 1973 issue represent the complete functional vision evaluation as practiced at the Central Blind Rehab Center, Hines, Ill. We are happy to publish in toto the explanation for those forms below, which was furnished to us by Mr. Quillman and Mr. Haith. Persons desiring further information on this evaluation may contact the Central Rehab Center, VAH, Hines. Ill.

LOW VISION-FUNCTIONAL VISION EVALUATIONS

The Low Vision Evaluations, as they are done at Hines, VA Hospital, are attempts to assess the visual functioning abilities of low vision patients, as it pertains to normal daily living activities. For this reason, we call them our Functional Vision Evaluations.

The objectives of the evaluations are threefold: (1) to determine each patient's visual functioning level; (2) to determine the specific needs of the patient for rehabilitation in relation to normal daily living activities; and (3) where possible, to improve, through training, each patient's visual functioning level.

The evaluations are periodically reviewed, and occassionally changed when any part of the evaluation fails to provide the necessary information about the patient's visual functioning. The evaluations include both distant and near visual functioning and are in seven parts. On all of the evaluations, the patient is allowed to use Rx or aid in his possession, except where otherwise indicated.

INITIAL INFORMATION, INTERVIEW, AND SUMMARY SHEET

This part of the Functional Vision Evaluations concerns itself with acuities, fields, and diagnostic information from the Ophthalmology Department, as well as routine information about the patient. Included are the patient's needs and his motivation for visual improvement. This part summarizes the other evaluations and brings together all essential information about the patient so as to facilitate the optometric examination of the patient.

ASSESSMENT OF LOW VISION ACUITIES, FIELDS, AND NEAR VISION

The objectives of this part are: (1) to obtain visual acuities, under ideal lighting conditions, through the use of the Feinbloom Chart. This includes obtaining visual fields when possible.; (2) to determine for near point each patient's visual functioning level for daily living activities. The task oriented items are designed to assess visual functioning as it relates to performing a specific task.

FUNCTIONAL VISION EVALUATION - ROOM IDENTIFICATION

This evaluation is conducted in an area that has been set up specifically for this evaluation. The area consists of furniture to be found in most indoor situations. The setting remains constant, but the lighting is a changing variable.

The objective of this evaluation is: to assess functional vision for the purpose of identifying objects in a room under varying degrees of illumination. The evaluation is conducted from a position approximately 12' from all items. The standard approach is: (1) to begin with the lights off, window shades half drawn; (2) followed by repeating identification with the lights on and the shades half drawn. If the patient feels he is distracted or suffers glare from a source of illumination or needs to be closer, this evaluation is scored under adaptive and detailed description of the adaptation is made on the back of the work sheet.

FUNCTIONAL VISION EVALUATION FOR MOBILITY - INDOORS

No cane is used on any of the mobility evaluations. The patient relies totally on his residual vision and may wear sunglasses or appropriate Rx.

This evaluation is done in the corridors of the hospital. The objectives are: (1) to assess the patient's vision for independent travel in corridors which have varying degrees of congestion and illumination; (2) to check each patient's ability to visually detect and avoid moving of stationary objects; (3) to check the effects of changes in illumination on travel ability; (4) to check the ability to visually identify landmarks in these corridors; (5) to determine if vision is good enough to recognize previously travelled area and return to the Blind Section unassisted; and (6) to assess the ability to recognize and travel on poorly illuminated stairs.

The procedure is to start the patient at the gym on the third floor and have him locate and travel down the stairs to the first floor. He is then instructed to proceed through the corridors in the hospital to the police station in "F" Lobby where he locates the landmarks listed on the work sheet. He proceeds from there to "D" Lobby, approximately one-half mile from the Blind Section. At this point he is instructed to walk north in the east corridor of the old hospital building, looking for a familiar landmark or area ("F" Lobby). When he finds this area he is to travel back to the Blind Section.

FUNCTIONAL VISION EVALUATION - MOBILITY RESIDENTIAL

This evaluation is done in the residential area of Maywood. The objectives in this evaluation are essentially the same as those in the indoor mobility evaluation, except as they relate to outdoor situations. Objectives which apply specifically to outdoors are: (1) to visually follow the sidewalk and shoreline, to detect curbs and traffic; (2) to visually check intersections for signs and traffic, as well as cross streets; (3) to locate landmarks of varying sizes, shapes, color, and contrast, so as to obtain visual information about his enviroment; and (4) to independently travel a distance of several blocks and then locate the starting point.

This evaluation consists of walking 10 blocks, the first five of which the patient is to visually locate various items. At the beginning of each of the first five blocks, the patient is given a number of items he is locate within that block. At the end of the fifth block, the patient is instructed to return to the starting point, but that he should not walk along any of the 2 previously travelled streets. If he successfully returns to the starting point as instructed, the run will take the shape of a rectangle. The return trip is designed to determine how well oriented the patient can remain in an unfamiliar enviroment.

FUNCTIONAL VISION EVALUATION - MOBILITY BUSINESS

This evaluation is done in the business, semi-industrial area of Maywood. The objectives in this area include all of those listed for mobility indoors and residential. Essentially, the objective is to asses the patient's visual functioning for travel in this complex situation. Of primary interests are how well he recognizes main artèries of traffic, railroad crossings, how well he negotiates these situations, and locating a business establishment (bank).

The procedure for this evaluation is primarily the same as for the residential area. The biggest differences are that he is locating just one item and he is making street crossings at traffic lights. Again, the patient must return to the starting point via a different route.

FUNCTIONAL VISION EVALUATION - NIGHT

This evaluation is conducted in the residential and business areas of Maywood. The objectives are essentially the same as previously mentioned, except as they apply to travel at night. Additional objectives are: (1) to determine how the patient reacts to the lights of oncoming vehicles; (2) to ascertain if the patient can locate intersections which are controlled by traffic lights; and (4) to return to the starting point independently and locate the car.

On this evaluation, the patient begins in a residential area, proceeds to a business area, where he locates a business establishment, and makes a return trip to the residential area. The patient makes all street crossings independently.

EVALUATION OF DISTANT AIDS

This evaluation is conducted in the gym of the Blind Section. The objective here is to find a distant aid which might be beneficial to the patient in terms of enhancing his visual concept of the enviroment. The targets are a street sign and the mile indicator on the

Exer-Cycle. (The dimensions of the targets are indicated on the work sheet.) These targets are sighted at 40', 20', and 100 yards (looking outside through a window). The patient is shown how to focus and hold each aid prior to focusing on the targets. In cases of eccentric fixation, this might require a couple of periods. After working with all the aids, the patient makes his selection of the aids, first and second choices. Later, these same aids will be used in his mobility program.

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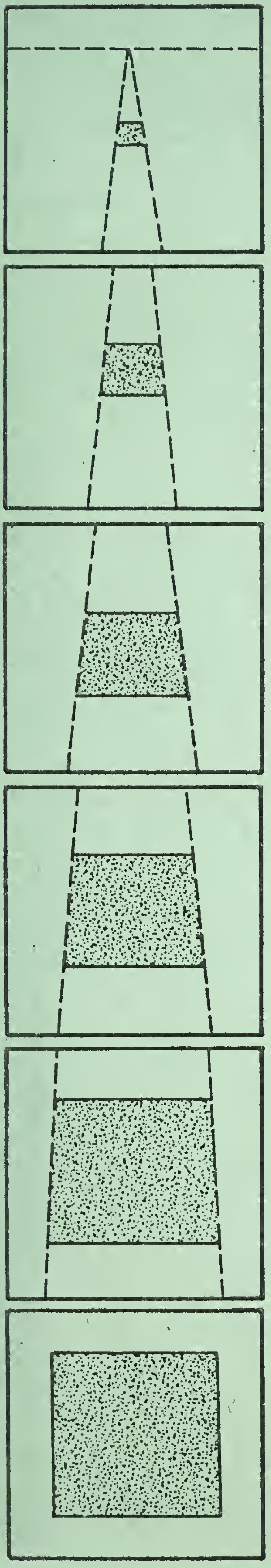

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CONTENTS

FEATURE ARTICLE

Visual Training Seminar on Low Vision
Sherrill Adams, Paul Del Frari, John Hall, & Shari Pollack.................. 1

ABSTRACTS

Partial Sight.................. 9

Survey of U.S. Agencies Serving the Blind and Low Vision Client.................. 10

The Low Vision Evaluation Kit.......................... 11

The Evaluation of Auditory Object Perception in Low Vision Persons as it Relates to Orientation and Mobility... 12

Evaluation of the Functional Behavior of Low Vision Students.................... 13

Functional Vision Evaluation: a Survey Study of Ophthalmologists in the Los Angeles Area.......................... 14

Low Vision Simulation for Potential Orientation and Mobility Specialists.......... 15

COVER:

The illustration is of successive transformations of the image of a square of pavement while a person is walking along a street. It was given by J.J. Gibson in The Perception of the Visual World. "A transformation is a regular and lawful event which leaves certain properties of the pattern invariant."

The motif of Low Vision Abstracts is TRANSFORMATION of Orientation and Mobility and Peripatology through an increased understanding of the visual environment of the low vision person.

EDITORIAL.................. 16

SUGGESTED RESEARCH TOPICS.. 17

CURRENT BIBLIOGRAPHY....... 18

VISUAL TRAINING
(Low Vision Seminar)

By Sherrill Adams, Paul Del Frari,
John Hall, and Shari Pollack

Visual training regards effective visual perception, specifically an awareness of, speed of response to and accuracy of location of objects and discrimination of spatial relationships between them, (Margach, 1968). Cunningham delineates the goals of visual training as image perception, recognition, retention and association with previous visual experience. Similarly, McDonald (1962) records as the objective to see space as a solid, directing attention to any area while still maintaining an awareness of the solid.

Attention was initially given to teaching this mastery of visual perception during World War 1, with the goal of bomber pilots' rapidly identifying the enemy plane. It has evolved into a series of ocular exercises, primarily for the normally sighted individual but now extending to include those with visual impairments, learning disabilities, etc. The following cited as references, are described to be administered at the peripatologist's discretion, or minimally to give him an awareness of what is being done by some ophthalmologists in order to improve visual perception.

The concept of visual training assumes two premises; that perception can indeed improve, and that this improvement occurs with practice. Nearly all research in this area provides significant positive results hat this is indeed the case (Gibson, 1969); we can tell our eyes what to look for, rather than their telling us what to see. Hypotheses accounting for this change in behavior vary. Gibson suggests the dual explanation that the learner accepts a lower level of confidence regarding the number of samples necessary for him to make a perceptual judgement and that he employs different critical features for detection. Bruner (1957) adopts this second explanation, that the perceiver learns to mask less accessible ones. Barraga (1970) implies that perception is learned when an object is seen not as a bundle of absolute characteristics, but when it is seen consistently each time.

Studies indicate that perception is more accurate with redundancy of information and increased sample size (McDonald, 1962), and that pertinent to form discrimination, the number of repetitions for learning is a function of the shapes' characteristics and the amount of exposure time (Kederis, 1970). The role of reinforcement in visual training skills may be self-regulatory, that improvement "rings a bell" and external reinforcement is extraneous.

Consistent individual differences have been detected in visual perception, which should be considered in visual training sequences. Witkin (1959) reports a highly reliable distinction between individuals which he labels as field dependence and field independence, the former relying upon visual cues when vision and kinesthesis offer contradictory information and the latter relying on kinesthetic cues. Cunningham similarly found different types of perceivers, some having consistent difficulties in determining the starting point of a task, others scanning several times before beginning, etc. Thirdly, McDonald terms individual differences as a Trees-to-Forest ratio, a spectrum of figure versus ground perception along which everyone can be placed.

Two modes which should be encouraged throughout the following exercises are relaxation and verbalization. "Looking harder", straining neck and facial muscles, and general tension make visual perception less effective, and relaxation should be substituted. Secondly, verbalization during perception helps to organize and retain visual stimulation and to assist the instructor in assessment and clarification.

1. Visual Training Concept: Open Cue Searching

Bruner delineates three levels of patterning perceptual information: (1) open cues searching, unstructured looking by a relatively uncertain perceiver, (2) selective search, confirming cues by a partially certain perceiver, and (3) gating and distorting, categorizing cues beyond a certainty level. The first type of perception is being encouraged in orientation and mobility. Barraga recommends talking about how something looks to a low vision person rather than naming it or describing how it should look; her goal is that a target look the same each time it is perceived. A similar diagnostic approach is to show the student a picture and ask what he sees. Note if he immediate identifies objects, if he describes color cues first, if he identifies objects or ascribes meaning to a scene, etc.

1. Tape a student's description of what he sees while looking out a window, then play back the tape for him.

2. Listen to the instructor's verbally describing another individual in the room, then name the person being described. Modify this by describing objects in the room.

3. Place a cookie, apple, etc., in front of a student at distances increasing up to twenty feet. Explain that he may have it if he looks at it and describes it.

4. To reach the objective of delayed closure, that is, observation without premature labeling, show the trainee an out-of-focus slide. Tell him that it is a blur, but to keep looking. Warn the perceiver that it is too easy to say that you know what something is and to stop looking, ask him not to try to figure out what the picture is, but to just describe it, not to immediately evaluate or explain what he sees but rather to wait for more information. Mislabeling before certainty distorts perception. Gradually adjust the slide to be in-focus and ask the student to identify it only when he is certain of its identity.

J. Visual Training Concept: Visual Motor Coordination

The following exercises are suggested to increase coordination of eye-hand and eye-foot, and to improve motor-wise reproduction from prior visual experience.

1. Hold a cane twelve inches above the floor. The student is to walk forward to it and step over it, and to walk backward to it and step over it. With the cane held at five feet, walk forward and backward under it. Modify this with various cane heights.

2. Ask the student to move himself and then another person to be to the left, right, front and back of a given line. (A pedestrian cross-line might be appropriate, on both black and grey surfaces and of different widths.)

3. To associate the visual with the kinesthetic, expose the student to a series of shapes (such as one circle, rod, square, diamond and rectangle) for five seconds. Remove the shapes and ask the students to reproduce them from memory. Vary this exercise using patterns of coins, blocks, utensils, numbers, etc.

4. To enhance monocular centering, bring the index fingers to meet at eye level, using one eye at a time. Bring a pencil held in one hand and the index finger of the other hand to meet, two pencils, etc. Remain aware of the visual background.

5. To develop visually directed movement, throw a ball into a basket at four feet, six feet and eight feet, while looking directly at the basket and then to either side. Throw a ball from the left hand into a basket on the right one and one from the right hand into a basket on the left simultaneously. Throw a ball from the left hand to the left basket and right to right simultaneously.

6. In a dark environment, shine a light and have the student look at it. Turn the light off while the student tries to keep looking where the light was. Turn the light on again for confirmation.

7. To locate high, low and center areas with respect to the body, stand straight and look at a point at eye level. Touch the middle fingers at eye level and midline. Look again at the point; if the fingers did not seem to move, then they were on the midline. Repeat at forehead (top level) and waist (bottom level).

8. Walk parallel to a pointed line, tape or rope placed on the floor, near the floor, at waist level, and at the head level. Maintain various distances from this parallel guideline.

II. Visual Training Concept: Visual Motor Coordination (continued)

9. Walk from object to object placed in a line at various distances from each other. Repeat with objects in a zigzag pattern

10. "Follow the leader", with instructor walking in front and increasing turns from those which are very slight to up to ninety degrees.

11. Practice reaching out to touch objects of various sizes and colors and in different lighting conditions. Similarly confirm distances from an object with the cane.

12. Gestures bringing the hands into view may be a means of checking visual fields or acuity. Substitute socially unacceptable gestures with those which are more socially acceptable.

III. Visual Training Concept: Visual Memory

Visual memory, or visualization, is an abstration and generalization of the visual image, and is to be preferred over eidetic imagery, which is an exact mental reproduction. Visualization contributes to open cue searching in that it allows for delayed closure, i.e. observation without premature judgements.

1. One approach to analyze and explain to the student an individual's visualization or personal method of organizing space is to ask him to picture a landscape, complete with trees, a field and a hill. Ask him if he conjures up this mental image easily. Does he see it in real size or scaled down? Is it in color? Is he aware of his own point of view? Can he assume different points of view and still see the scene? Can he see one item and the whole scene at the same time? Does he feel himself looking? Is the sun shining?

2. Look at seven objects (coins, pencils, etc.) for ten seconds. Close eyes while one of the objects is removed. Determine from memory which object was removed.

3. Look at six objects on a table. Cover them. Look at the duplicate of one of these objects for five seconds. Remove it. Locate this duplicate's original among the now uncovered six objects. Modify this exercise using dominoes, directional arrows, playing cards, etc.

4. Ask the student to visually familiarize himself to a room. Occlude him, and ask him to walk to designated objects in the room. Visually familiarize self again and repeat. Vary by turning the student around before naming destinations. (Note that efficient visual familiarization whenever possible may be particularly important for an individual whose vision varies from different conditions or whose pathology is progressive.) This exercise may be adapted to an outside situation.

IV. Visual Training Concept: Tracking and Fixations

(It is recommended that these exercises be administered for only a few minutes per session, or as prescribed by an opthalmologist.) Training in this area develops ocular external muscles and transfers to scanning and to quickly fixated perception. It further facilitates distinction of figure from ground and of depth, since it involves movement of the eyes with the field steady, of the field with eyes steady, or both. Observe that scanning is much more effective with an awareness of personal orientation or own point of view. Throughout these exercises, encourage the student to remain aware of the background as well as the object being viewed.

1. Visually track, i.e. remain looking at a flashlight which is being moved in patterns. Motions whould be initially slow and gradually increase in velocity, with the student's determining his preferred distance for viewing.

2. Track luminiscent paint or tape which has been applied to a revolving phonograph record.

3. At a game of tennis, ping-pong, etc., track the ball.

4. To develop saccadic fixations, rapid shifting of attention, tend both forefingers at shoulder width. Look alternately from one to the other to a steady count, music, or metronome beat. Be aware of where one finger is when looking at the other. Modify this exercise by raising one hand and lowering the other and vice versa. Repeat the exercise with the eyes shut.

5. Number four objects spread in a room. Fixate on these objects named in random order in a rhythmical beat. Try to remain aware of all four objects at once.

6. Align a near object with a far object. Alternatively shift visual attention from one to the other at one second intervals.

7. With one eye occluded, extend the thumb in front of the nose at arm's length. Visually track the thumb as it moves up, around ninety degrees, then across to the nose. Practice smooth rotations of the eye and awareness of the thumb in relation to the background.

8. Holding two fingers and the thumb as if holding a marble, ascribe a circle, and visually fixate this. Shut both eyes and follow where the hands are kinesthetically perceived to be as they ascribe this circle, periodically opening the eyes to check accuracy.

9. Fixate on a spot at eye level about ten feet ahead. Keep fixating as the head slowly turns from one side to the other and around.

V. Visual Training Concept: Maximal Use of Peripheral Vision

In most low vision cases, the loss is primarily in central vision, which answers "What is it?" Peripheral loss, however, which answers "Where is it", is a more serious decrement to orientation and mobility and there are fewer low vision devices applicable to it.

1. To expand the amount of visual information comprehended at one time, look at a calendar on a wall from eighteen inches, thirteen inches, and ten inches. Using one eye at a time, fixate on the center number into groups of nines, fours, etc.

2. Modify the above exercises by fixating with one eye on a central point and verbally identifying the names of colors of concentric circles from innermost to outermost.

3. (Note: this exercise may be inapplicable to certain populations, particularly those with photophobia, and should be administered only as prescribed by an ophthalmologist.) To visually gain information from large areas of space, use the effect of after-image. The student should look at the light of a 100 watt bulb shone for ten seconds from six to eight feet away. Turn off the light for awhile. Repeat. Attempt to see a larger and larger area as an after-image and to comprehend objects in this area faster.

4. Look ahead as objects are slowly moved into the field of view. Describe these objects as soon as they are clear.

VI. Visual Training Concept: Distinction of Foreground From Background

Distinction of trees from forest, field dependence from field independence, appears to be a reliable individual difference as measured by the embedded figures test. Employ the principles of motion parallax to facilitate judging object from background, that separates that object from the others. This motion may be on the part of the object, the perceiver, or both.

1. Looking at two straight lines painted or taped on a floor with curved lines superimposed on these, walk between the straight lines and then between the curved lines. Modify this by looking at and walking on the path of each, respectively.

2. Step over various sized objects on various backgrounds, such as a ball on grass, on hot top, on dirt. Identify the backgrounds.

VII. Visual Training Cocept: Discrimination of Shape and Position

While the ability to perceive object forms is probably innate, it is influenced by maturation and learning. Visual acuity normally increases up to the age of eighteen months. Learning forms is a function of the time exposure to them and the character of the figures themselves, simple and symmetrical forms (circles then squares then triangles) being the easiest to learn. Throughout the following exercises, remind the student to keep looking and just describe the form rather than prematurely labeling it.

1. Relate the frequently encountered objects to their basic geometric forms. For example, a person may resemble a rectangle, a house a square, a pole a rod, and a car an oval.

2. Develop a vocabulary for shapes, sizes, positions, likenesses and differences in order to clarify visual impressions and make assistance more effective.

3. Group objects of similar shape, such as an apple with a ball and a hammer with a spoon. Similarly group them by position, such as side view, upright, sitting, etc.

4. Touch all like shapes in the environment, such as the circles a glass rim, chair seat, wastebasket, car headlight, etc. Touch objects of like sizes, position (horizontal, verticle, and diagonal) and color.

5. Walk to all the rectangles, diamonds, etc., which are positioned horizontally, which are positioned vertically.

VIII. Visual Training Concept: Perception of Distance and Depth

1. Walk to various lines from given points at different distances. Verbalize if the line is subjectively estimated as near or far. Judge the number of feet from the point to the line. Move objects near and far from a given line.

2. To develop quick and accurate computation of dimensions in space, extend a tape measure between the two hands to the estimated height, width and depth of objects named in a room. Correct errors by walking to these objects.

3. To develop consistency in space-matching, based on the approach that it is not important how objects look as long as they look the same way twice, look at a picture of frequently encountered objects. If the picture is of automobiles, ask if they are real size.

3. (continued) Could this many automobiles fit into a picture this size? Present pictures which are life-size, scaled up and scaled down.

4. Remaining stationary, the student should estimate which of two people crossing in parallel paths in front of him is nearer. Estimate the likelihood of their colliding. Increase the distance of the two people from the student. Conduct this indoors and outdoors in different lighting conditions. Repeat as the student moves toward the two people while they are crossing.

5. The student, remaining stationary, should estimate the direction and likelihood of collision with the instructor, who is walking toward him. Repeat with the instructor stationary and the student walking toward him, then again with the instructor and the student walking toward each other.

6. Name which objects are in the front, middle and back of an arrangement of pegs, balls etc. Repeat outside with trees, houses, cars, etc.

7. Estimate the number of steps to and halfway to an object. Estimate the number of blocks or miles to a very distant object.

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Margach, C. 1968, McDonald, 1962, and Witkin, 1959 (Ed. note: references incomplete)

ams, Sherrill "Partial Sight"
Del Frari, Paul
Hall John
Pollack, Shari
Peripatology Program
Boston College
1974

This is a survey of the problems facing low vision individuals and the aids available to them. Fortunately, it does not fall into the trap of trying to rigidly define the terms low vision, partial sight, etc. Rather, the author tries to enumerate the characteristics that are associated with low vision (relying heavily on Faye to do so). Additionally the problems of the low vision individual are compared to those of the totally blind and emphasis is placed on the greater difficulty some low vision individuals have with mobility than most totally blind have.

Among the problems facing the low vision individual (and mobility instructors) are the social and psychological changes accompanying the reduction in visual skills. The social factors may be minimal or they may be pervasive, for example, an almost complete loss of mobility. The psychological factors will vary from individual to individual and will be influenced by a large number of variables. These include reaction of family and friends to the visual loss, the effect of the loss on job and mobility, the effectiveness of the individual in utilizing environmental cues, age, age at onset and the individual's psychological strengths, to mention a few. The paper also furnishes a brief guide for improving these factors that may be useful to mobility instructors.

The authors also enter the discussion of whether or not the low vision individual should have blindfold training. The authors present their arguments in an orderly and coherent manner and do not take a rigid stand for or against the blindfold. They state conditions when they feel the blindfold would be beneficial and conditions when they feel it would not be beneficial. The final decision, as always, must be made by the mobility instructor using his best clinical judgement.

The authors conclude with a discussion of low vision aids available to the low vision individual.

Adams, Sherrill
Del Frari, Paul
Hall, John
Pollack, Shari
Peripatology Program
Boston College
1974

"Survey of U.S. Agencies Serving the Blind and Low Vision Client"

The intent of this paper was to survey the attitudes of some agencies serving the blind and low vision client concerning some of the current issues in the field. A concensus of opinion on such topics as whether or not the blindfold is beneficial to the low vision individual or what research is being conducted would make interesting reading and be very informative. This paper was only partially successful in this respect. This was due to poorly worded questions, a failure to adequately compile the results of the survey and, to a certain extent, the failure of some agencies to respond to the questionnaire.

Some of the results are of interest. For example, only 3 of 14 agencies use the blindfold more than 25% of the time, but only 1 agency does not use it at all. In the majority of cases (7) the decision on whether or not to use the blindfold is left up to the O&M specialist. In four cases its use is to encourage the development of the other senses (which appears to contradict the findings on the percentage of time the blindfold is used), and in 3 cases the agencies have no specific policy. As regards the use of a cane by low vision individuals, most agencies (9) feel it is a good means of identification, while an additional 4 agree with its use and only 2 "shy away from it". In addition,to these results the authors include a number of specific comments made by the responding agencies.

In conclusion, this type of survey has a great deal of promise in determining what attitudes, policies and procedures are used by O&M specialists, and agencies serving the low vision individual. Such information is valuable. This paper would form an excellent starting point for anyone contemplating such a study.

Ehrnst, Stephen F. "The Low Vision Evaluation Kit"
Orientation and Mobility Program
Western Michigan University
1974

The author has shown a good deal of ingenuity in the construction of a field kit for evaluation of low vision individuals. His criterion appears to be an easily portable, low-cost test kit. The contents include:

1. Acuity Testing (near and distant)
2. Color and Shape Discrimination Testing
   (Primary Color and Farnsworth Dichotomous Test)
3. Visual Field Testing
4. Braille Testing Instructions

The kit described is relatively complete and the explanations and procedures are clear and comprehensive. The one shortcoming of this proposal is the substitution of Dutch Boy Paint Chips for the Farnsworth Colors. While the Dutch Boy "chips" may superficially match the Farnsworth Colors, it is doubtful that they fully replicate their hue, alue and chroma, thus they may not be completely satisfactory. It would be preferable, though slightly more costly to purchase the appropriate colors from the Farnsworth distributor or their equivalents from the Munsell Color Company. The cost of a kit constructed in this manner may be $10.00 or less.

On the whole this paper would be excellent reading for anyone contemplating the construction of field kits or testing low vision.

Hazard, Willis G. Jr.
Orientation and Mobility Program
Western Michigan University
1973

"The Evaluation of Auditory
Object Perception in Low
Vision Persons as it Relates
to Orientation and Mobility"

The author notes that one problem of some low vision people is fluctuating vision. Fluctuating vision may be charateristic of a particular disease (e.g., diabetes mellitus) or environmental factors (e.g., ambient illumination, brightness, size, reflectance), but in any case it can have far reaching implications for the individual. In his review, Mr. Hazard notes these implications, and expands them to include the interaction of the visual sense and the auditory sense. Specifically, the question he asks is whether or not variation in visual input will cause variation in the utilization of auditory information. While the author was not able to find any previous references to the interaction of fluctuating vision and auditory performance he does give a clear summary of some of the major work done on auditory discrimination by the blind.

The experimental procedure involved two tests using the same subjects in each test, with the order of testing counter-balanced. The subject's task (in both situations) was to detect the presence or absence of a four foot pole with a one foot square piece of cardboard attached to one end. In this respect the author's title is misleading since the experiment involves object detection, not perception. The direction from which the object would approach the subject was made known to him and each subject was given a number of practice trials to familiarize himself with the experimental procedure.

In test #1 each subject had a three inch by five inch filing card taped to each temple to occlude side vision. A white noise source (db level unknown) faced the subject and provided an auditory cue. Test #2 was identicle to test #1 except the filing cards were replaced by a "sleepshade". Thus, test #1 simulated fluctuating vision and test #2 was the absense of vision.

The results of this experiment indicate a superior performance in auditory detection with the "sleepshade" ($t= -2.89$, $df= 19$, $p=0.005$). The author concluded the higher efficiency may be due to an increased concentration when visual stimuli are minimized. He further discusses these results in terms of the reduced mobility of low vision individuals.

Smith, Jesse D.
Orientation and Mobility Program
Western Michigan University
1973

"Evaluation of the Functional Behavior of Low Vision Students"

A major problem in the construction of any behavioral evaluation is that of constructing situations which differentiate individuals. "Mere classification or the assignment of numbers does not answer our goal" is the way Mr. Smith stated the problem. Simply stated, the problem is one of structuring situations that will tell us what one individual can do that another cannot. Further, it will give us some indication of why this difference exists, and perhaps, of ways to improve poor performance.

Mr. Smith has attempted to construct such an evaluation tool for indoor settings. The situations covered are for low vision individuals and cover such diverse tasks as determining size and shape of objects, adaptation to sudden changes in illumination, method of locating objects and so on. The pathologies represented in the subject population included congenital amblyopial diabetes, optic atrophy, retrolental fibrophasia, choreoretinitis, uveitis, and keratoconus.

Mr. Smith does not present an analysis of the data he obtained, however, an analysis done by the abstractor indicates this particular scale does not differentiate between any of the subjects of this study. There are three possible explanations for this. First, there may be no differences between the subjects. However, this is extremely unlikely. It is likely that this scale does not reflect the differences that are present. Secondly, the behaviors Mr. Smith used were all complex. For example, the detection of stairs involves a number of behaviors, eye scanning, detection of cues associated with stairs, etc., thus it may be that these behaviors should be studied rather than the more complex behavior. Thirdly, Mr. Smith utilized, in most cases, only one subject with a given pathology. It is possible that if he had used fewer pathologies and more subjects with common pathologies that performance differences would have become apparent. This type of study can be very fruitful and more work is needed in the area.

Unell, Annie
Orientation and Mobility Program
California State University,
Los Angeles
1974

"Functional Vision Evaluation:
A Survey of Ophthalmologists
in the Los Angeles Area"

The evaluation of anyone entering a low vision program begins with the ophthalmological report. However, these reports are too often incomplete. For exmaple, the lighting conditions used by the ophthalmologist are not stated, a prognosis is not given, color perception in a variety of lighting conditions is not stated, and the rate of vision loss is not given. This lack of information hinders the O&M specialist in providing an optimum program for the low vision student. Unell's study attempts to assess the willingness of a group of ophthalmologists to improve their reporting procedures and thus improve their contribution to the training of low vision students.

Unfortunately Unell's results are not encouraging. Of the 315 ophthalmologists contacted (by mail) only 49 or 15.5% responded. Of these 49, 16 returned the questionnaire unanswered! The 33 responses indicated a willingness to increase prognosis description in their examination reports. Most were willing to describe what changes are likely to occur in terms of slow or rapid decrease in acuity and/or visual fields. The 33 ophthalmologists were evenly divided on standardizing lighting conditions for their examiniations. 48% favored standardization and 48% did not favor it. More than half did not favor providing additional information on color vision. There was also an even split between those willing to include an indication of a time element in their prognosis and those not favoring such an indication. More than half (57%) expressed a willingness to utilize photos and films in their examinations. Similarly, 57% expressed some interest in seminars or conferences on low vision. Further, 75% expressed an interest in learning more about Orientation and Mobility through literature and/or by observing mobility lessons.

One cannot help but be dismayed by the poor response to this survey, however, it is encouraging to see a reasonably high percentage of those responding expressing a willingness to improve their evaluations. Most encouraging was the fact that 75% wanted to learn more about the orientation and mobility field. Perhaps by utilizing this interest it will be possible to improve the working relationship between the O&M specialist and the ophthalmologist. Both groups have something to gain.

'mmerman, Lenard
Elliott, Michael
Visual Disabilities Program
Florida State University
1973

"Low Vision Simulation for Potential Orientation and Mobility Specialists"

Zimmerman and Elliott have developed a training program for Orientation and Mobility Specialists to aquaint them with the mobility problems of low vision individuals. The program involves the simulation of various acuities and field defects. Specifically these are:

Acuity	Field (degrees)
20/20	20
20/40	40
20/80	60
20/200	80
20/800	100

The simulation uses a refinement of the masks developed by Dr. Jose, O.D. (University of Alabama, School of Optometry) and Dr. Newman, O.D. (Tampa, Florida). The masks are binocular and use lenses to simulate acuity. Field defects are simulated by "tube-like" structures protuding from the eyes of the mask.

The initial evaluation will be performed on six orientation and mobility students with ten hours time spent in each of three situations (indoors, residential and commercial). Specific criteria have been established for each situation and evaluations will be made by an O&M specialist. Each student will be evaluated with each simulator and the data will be analyzed.

It is to be hoped that the authors will furnish the data for inclusion in a future edition of Low Vision Abstracts.

EDITORIAL

Low Vision Organizations Grow

Within the past few months one new low vision organization has published its periodical and another is organizing and seeking potential members. Low Vision Abstracts subscribers may wish to take part in one or both of these organizations for the rich professional learning experience which they promise.

The Low Vision Clinical Society is an organization which started with a handful of interested ophthalmologists in September, 1972. They have brought out the first issue of their periodical "Nearpoint". The newsletter contains a discussion of organization affairs, recent papers, current meetings and new optical aids. It seems to be primarily concerned with near vision and clinical services but appears to be a good source of general information to Mobility Specialists. It has a sense of action and progress to it that bodes well for the development of low vision knowledgeability and service in our field.

Membership in the Low Vision Clinical Society is open to ophthalmologists, and with sponsorship, special category membership status is open to others. Inquiries should be directed to the Low Vision Clinical Society, 121 E. 60th Street, New York, New York 10022.

Professionals in the field are being contacted by Dorothy Corvin, Supervisor, Eye Health Services, Virginia Commision for the Visually Handicapped, to determine their interest in being members of a Low Vision Interest Group in AAWB. Ms. Corvin states "...the opportunity would be afforded to learn about other programs, to learn about new aids and techniques and thus to enhance our own expertise and operations." Such a group would require the petition of twenty-five members of the organization and the approval of the board of directors. Contact Ms. Corvin if you are interested.

UGGESTED RESEARCH TOPICS

1. Electronic mobility devices have been in existance for about a decade. Compile a bibliography of work done on them and evaluate their potential usefulness to low vision individuals. That is, the IT&T image intensifier appears to be useful for individuals without night vision. However, do laser canes, bineural sensors, etc., have the same potential?

2. Visual acuity is defined in terms of specific distances, minimum separable, minimum visible, etc. Ideally thse measures are taken under specified conditions, however, in doing so they have only limited functional applicability. The project then, is to equate these measures with the ability to see specific objects under more "natural" conditions. The objects could be street signs, poles, obstacles, recognizing types of vending machines, etc.

3. Attempt to determine how the concept of particular objects changes by severity and duration of visual loss. For example, how does the concept of the physical structure of cars change with one year of loss versus ten years of loss?

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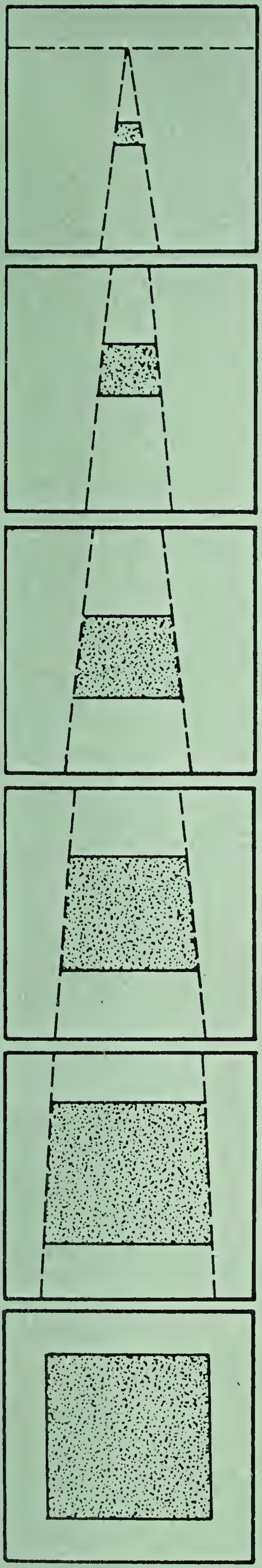

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CONTENTS

FEATURE ARTICLES

Low Vision Aids and Their Practical Application to Activities of Daily Living
Pamela Cory......... 1

Orientation and Mobility and Low Vision Training Without Aids: Trends and Needs
Audrey Smith........11

ABSTRACTS

Development of a Scale Designed to Measure Functional Distance Vision Loss Using An Interview Technique............. 23

A Study to Evaluate the Effectiveness of an Intervention of Utilization of Residual Vision on the Independent Mobility of Persons With Low Vision................ 25

Aspects Limiting Successful Use of Aids by Low Vision Individuals................. 26

Visual Training and Mobility Training for the Person With Low Vision................ 27

COVER:

The illustration is of successive transformations of the image of a square of pavement while a person is walking along a street. It was sketched from a figure given by J. J. Gibson in The Perception of the Visual World. "A transformation is a regular and lawful event which leaves certain properties of the pattern invariant."

The motif of Low Vision Abstracts is TRANSFORMATION of mobility, rehabilitation, and classroom teaching through an increased understanding of the visual environment of the low vision person.

EDITORIAL.............. 28

LVA COPY REFERENCE SERVICE................ 29

CURRENT BIBLIOGRAPHY... 30

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LOW VISION AIDS AND THEIR PRACTICAL APPLICATION TO ACTIVITIES OF DAILY LIVING

By Pamela L. Cory
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I. The Role of Rehabilitation Teaching in Low Vision Care

Interest in low vision has developed to such an extent that orientation and mobility specialists not only incorporate optical aids in their lessons, but as a group, exercise much influence in determining the structure and policy of the low vision movement, both on a local and national level. Unfortunately, other rehabilitation professionals who work with low vision individuals have not given enough attention to how low vision aids can be incorporated in other areas of the client's rehabilitation program. Drs. Mehr and Freid recognized this fact when they wrote:

> In the past, great emphasis in low vision care has been placed upon improving the patient's ability to read Snellen charts and newsprint using some type of spectacles. Unfortunately, many of the requirements of everyday living have been neglected. (p. 115)

The teaching of these skills falls into the realm of rehabilitation teaching. In the past it has been an accepted procedure to teach a low vision individual to function as a blind person; this, however, is no longer the case. Now it is the responsibility of professionals working with low vision clients to encourage them to utilize all their remaining senses, so that they might have a much richer assortment of stimuli with which to interpret their environment. This holds true for rehabilitation teachers also. We must accept the responsibility we have toward our low vision clients.

Activities of Daily Living is a very important part of any rehabilitation program. Mastering simple daily living skills often restores the client's confidence in himself and gives him the needed incentive to want to learn more. It is important to remember, however, that this is not the most important part of the rehabilitative process. The goal of the rehabilitation process is to allow the client to achieve independent functioning in his present environment, and it was felt that this was best accomplished by coordinating the services of essential disciplines into one program.

Such low vision programs are structured to provide the client with services that will hopefully assure the actual use of his low vision aids. Most aspects essential for the client's rehabilitation are represented here, with the exception of techniques of daily living. The omission of rehabilitation teaching in low vision programs must be corrected. Rehabilitation teachers must take the initiative in familiarizing themselves and becoming involved with the facilities, optical aids, and training techniques of low vision centers. The low vision client will then receive the full benefit of a low vision center.

II. The Assessment Program: Utilizing Sight-Oriented Methods vs. Non-Visual Methods

Each one of our senses conveys specific information which is combined with other sensory output to form an interpretation of a person's environment. If the sensory information we receive is inadequate or deficient, then we are forced to make assumptions about our environment which could be erroneous and possibly even hazardous. With this in mind, the value of a good assessment program for determining the client's present level of functioning cannot be overestimated. It must be pointed out that this assessment program is not a measure of the client's general functioning ability, but rather, it indicates his functioning level under specific conditions for a specific task. The assessment program is presented here independently of the low vision evaluation. It is assumed, however, that a low vision evaluation is a prerequisite of this program, for it allows the client and instructor to realistically understand the potentials of his vision and to know in which situations it is necessary for him to rely on his other senses.

The assessment program consists of five basic steps: 1) Initial teacher evaluation of the client performing a specific task; 2) Further evaluation with active client participation; 3) Client decision as to whether he should alter his performance of a certain task (based upon the knowledge of the preceding evaluation), and if so, how; 4) Training the client in the use of new methods (use of other senses, optical aids, and non-optical aids); and 5) Teacher reevaluation of client performing the task.

The second step of the assessment program is probably the most important. It's success is dependent upon the communication level between the client and his rehabilitation teacher. Here, both the client and teacher attempt to objectively explore the client's degree of visual functioning during a specific task. Open discussion of factors affecting the client's safety must take place. The following questions should help facilitate this discussion:

Is the task itself a potential danger?

Is the environment in which the client is performing the task a safety hazard?

Do fluctuating factors cause a potential danger? (such as fluctuations in vision due to lighting conditions, or medications which the client has taken)

What is the client's visual acuity and amount of his field?

Is he performing at least up to the visual level that should be expected of a person with his amount of residual vision? If not, is he being limited by his vision or by another factor? (physical, mental, emotional)

Does the client rely on vision alone?

Does the client have enough vision left to be able to perform a specific task safely if he relied on his vision alone?

Does the client usually function non-visually?

Does the client have full use of his other senses?

Does the client adapt well and quickly to new situations?

Can the client independently find solutions to his own problems?

Does the client have confidence in himself?

The third step of the assessment program places full responsibility for the client's actions upon the client. He must realize that he is the one who has to make the ultimate decision as to which solution, if any, he chooses to adopt. The client is likely to be better prepared to assume this responsibility if he has been working with a knowledgeable rehabilitation teacher who is able to present a wide assortment of alternative methods with which the client can more safely and expediently perform a specific task.

In Step #4, the rehabilitation teacher utilizes basically three training procedures: training of the remaining senses; training in the use of aids adapted for non-visual functioning; and training in the use of aids (both optical and non-optical) adapted for low vision functioning. If the client's residual vision is so minimal that it serves no functional purpose, the rehabilitation teacher would probably deem it necessary to provide sensory training instructions so the client could learn to better interpret the percepts of his remaining senses. At the same time, he would introduce aids which could make the performance of these tasks simpler and less hazardous.

If, on the other hand, the client's residual vision is adequate for him to function visually, the rehabilitation teacher would want to train him in the use of optical and non-optical aids which would better facilitate his visual functioning. Here, it is of extreme importance that the low vision client accurately assess his visual capabilities so that he realizes there are times when, for safety reasons, it is necessary for him to resort to non-visual functioning. This involves a stable psychological constitution on the part of the low vision individual so that, when necessary, he will be able to utilize specific ideas and aids which are helpful to him, but which are geared toward the totally blind population without feeling that he has "given in" or relinquished his identity as a sighted individual.

III. Specialization of Low Vision Aids

Each low vision person's visual condition has to be considered individually. Although a client may have been diagnosed as having a particular eye ailment, this does not ultimately mean that the client possesses all the typical symptoms of that disease. No matter what the etiology of his partial loss of sight, the present condition of the eye and whether this condition is stabilized will determine whether optical aids are of a significant value.

Clients visiting a low vision center will exhibit extreme forms of low vision, and the optical aids necessary in assisting them to successfully utilize their residual sight will have to be powerful and specialized. At this point, it is important to note that low vision aids facilitate one's use of his residual vision; they do not restore the client's lost vision.

The nature of low vision optical aids is specialization. In order to achieve a high degree of a specific characteristic (for example, high magnification), one forfeits portions of another (visual field range). Another maxim appears to be: the higher the specialization of an optical aid, the more training involved in teaching the client how to use that aid. This specialization also limits the activities for which the aid can be of actual use. Generally, the more active a low vision client is, the more types of low vision aids he will require. These considerations have served to form the following low vision policy: Instead of issuing optical aids with the hopes that the low vision client will find some practical use for them, the low vision center attempts to discover the needs and desired of each client so that the aids issued are appropriate tools for achieving the specific tasks which the client has in mind. The client should then be trained in the proper usage of each particular aid he receives.

There is a distinct disadvantage to not having one particular optical aid - - such as regular spectacles - - which could be effective for the low vision client in all situations. This inconvenience often frustrates those individuals (the client and the rehabilitation professionals) who work with low vision aids. Unfortunately, it is far too easy to associate the low vision aid with the task or activity it facilitates, rather than with the specific operation it can perform. This "aid-task association" impedes the employment of the low vision aid in other tasks which have similar operational components as that previously performed by the aid. This must be changed. If the low vision client is to realize the full potential of his low vision aids, rehabilitation professionals must recognize the "aid-operation association" so that they can expand the use of the aids to other activities. Once the activities which the client wishes to perform are divided into operational components, the rehabilitation teacher can more easily determine if one aid (with or without modifications) can accommodate several tasks, or if other aids will be necessary.

IV. Low Vision Aids to Be Considered

Low vision aids for Activities of Daily Living should fit the following criterion: provide enough magnification to improve the acuity; cause little field restriction; and allow both hands to be free. The optical aids which immediately fit this description are spectacle lenses issued by an optometrist or ophthalmologist knowledgeable in low vision care. Whenever possible, lenses should be the primary recommended optical aid. When, however, lenses fail to improve the client's vision to a functional level, other low vision aids should be employed, either alone or in conjunction with the spectacles.

The following low vision aids could easily be incorporated into Activities of Daily Living:

Telescopic Sport Glasses: Telescopic sport spectacles, a distance vision optical device, are available in two powers: 2.5x and 2.8x. The telescopic spectacles move the objects closer to the viewer by enlarging the retinal image. There is a disadvantage to this, however, because only a small portion of the total field is magnified. The glasses can be focused as close as one meter.
The telescopic sport glasses allows sedentary viewing of distant objects (beyond one meter). What he views will appear closer to him and his field will be very restricted. The spectacles do allow hand freedom.

Reversed Telescope: Using the reversed end of a handheld telescope minifies distant objects or moves them further away from the viewer. This allows a larger portion of the total field to appear on the retina. Thus, for a low vision client who has tunnel vision and good visual acuity, using a reversed telescope would enlarge his visual field. A clip-on reversed telescope would be even more advantageous as it would allow the client hand freedom.

Headborne Magnifiers - Loupes: A loupe is a convex lens placed in front of the individual's spectacle lenses for improving near vision. They are usually attached to spectacle frames. They produce an enlarged image which appears to be farther away. They have the advantage of increasing the working distance between eye and object being viewed, and allow hand freedom and can be easily flipped out of the way when not in use. They are a good form of near vision magnification for the individual who needs only occasional high magnification. Loupes are available in monocular form with a range in power from 8 D to 32 D or binocular form with powers from ±4.00 D sph. to +10.00 D sph. It is important to note that the OS and OD of monocular loupes are not interchangeable.

Handheld Magnifiers: A magnifier restricts the visual field and must be held just within the focal plane for maximum image size. Handheld magnifiers range in power from ±4.00 D sph. to +80.00 D sph. There is a variability of working distance according to the strength of the magnifier. Magnifiers 20 diopters and higher must be held closer to the eye in order to increase the field and reduce aberrations. This does not, however, affect the magnification. Handheld magnifiers are very portable, and there is a wide range of pocket magnifiers, some of which have their own illumination.

Neck-held Magnifier: There is a simple neck-held magnifier with power ranging from 3 D to 5 D or the double strength neck-held magnifier with two lenses (5 D and 12 D). These magnifiers are chest supported with a cord fitting around the user's neck to hold the magnifier in place. This type of magnifier allows hand freedom and greater working distance.

Stand Magnifier: Stand magnifiers with a fixed object-to-lens distance, and focusable stand magnifiers where the distance from the lens to the page can be varied are considered here. Both types of stand magnifiers must be held close to the eye. The New York Association for the Blind claims that in high powers, the stand magnifiers offer the best field of any magnifying system. The main advantage of this type of magnifier is that it allows the individual to rest the magnifier on the page so that the focus is fixed. This is essential for clear vision. The drawbacks to this aid include lack of working distance between the lens housing and the object being viewed and incomplete hand freedom.

Gooseneck-Type Magnifier: This type of magnifier is a stand magnifier for near vision. It has a sizable amount of working distance between the lens and the object and, therefore, is not restricted to reading. There is complete hand freedom with this type of stand magnifier. The gooseneck or arm is adjustable which allows variability in the distance between the lens and object. Due to the attachment lenses available with the Luxo Illuminated Lamp, the powers can range from 3 D to as high as 23 D.

Illuminated Magnifying Mirror: This type of mirror provides a magnified reflection with adequate illumination.

C.C.T.V.: A closed circuit television is an electronic projection magnifier which provides an enlarged image of the object being viewed upon a T.V. screen. Activities other than reading are possible on this magnifier because the working distance between the camera lens and the object is sizable. It allows complete hand movement except when moving the viewing table for reading. The C.C.T.V. is able to increase or decrease the brightness and contrast of the viewing image. It also uses reversed polarity and/or the electronic line guide as its own illumination control. This type of projection magnifier requires that the viewer has good eye-hand coordination, especially if activities other than reading are to be performed.

Pinhole Spectacles: Pinhole spectacles, which serve as an illumination control, are glasses made of dark, opaque plastic with multiple pinholes located at and around the center of the lens. Fonda claimed that "pinhole spectacles improve vision for patients with opacities of the ocular media and irregular curvature of the cornea when macular function is good." (Fonda, p. 78) The reason for this visual improvement is because the pinhole permits a sharper retinal image. Although the spectacles facilitate hand freedom, they have several disadvantages: They limit the field of vision, and there must be considerable brightness present in order for them to be effective.

Typoscope: This nonmagnifying reading aid functions as an illumination control and consists of a black card with a viewing slit which has a size range from 3 to 7 inches in the horizontal opening, and 0.25 to 0.50 inches vertically. Its purpose is to reduce glare and increase the contrast between the lines being read and the surrounding area. The typoscope is placed directly upon the material being read with the words appearing in the reading slit. It must be moved down the page as one continues to read.

Tinted Lenses: Tinted lenses, especially ones with side shields and wide temples, have proven effective in reducing glare. Slip-in sun shades are also available for the individual with an Rx.

Lighting: The purpose of good lighting is to achieve adequate levels of illumination with as little glare as possible. High intensity lamps are good sources for high illumination because they direct the light to a specific place.

Lamp Socket Dimmer: The lamp socket dimmer enables one to adjust the illumination of a lamp. It is described as "merely a voltage regulator capable of adjusting the light intensity of a standard incandescent light bulb of up to 150 watts. The device provides all light intensity ranges between full brightness of the bulb and total darkness." (Kelleher, p. 823)

Relative Size Magnification: This category includes any object where the size has been enlarged to accommodate the low vision individual. Large print material, enlarged playing cards, and the enlarged numbers telephone dial are examples of relative size magnification.
Practical aids such as reading stands, felt-tip pens, bold-line paper, self-threading needles, etc., must also be included in this list. Although non-optical in nature, they are valuable tools for assisting the low vision individual to function independently. By no means does this list exhaust the entire stock of low vision aids. It does, however, introduce the rehabilitation teacher to the various low vision aids which could be incorporated in teaching Activities of Daily Living.

The following list of activities and the low vision aids necessary for their completion has been compiled for the rehabilitation teacher in hopes that it will assist him in exploring more effective approaches for teaching Activities of Daily Living to his low vision clients:

Adding Machines: C.C.T.V.
Gooseneck-type Magnifier

Arts and Crafts:

Ceramics: C.C.T.V.
Gooseneck-type Magnifier
Headborne Magnifier (loupe)

Crochet: Gooseneck-type Magnifier
Neck-held Magnifier

Drawing: C.C.T.V.
Gooseneck-type Magnifier

Knitting: Gooseneck-type Magnifier
Neck-held Magnifier

Sculpture: C.C.T.V.
Gooseneck-type Magnifier

Cooking:

Breaking an Egg: Gooseneck-type Magnifier
Chopping Food: Gooseneck-type Magnifier
Measuring Ingredients: Gooseneck-type Magnifier
Mixing Ingredients in Bowl: Gooseneck-type Magnifier
Peeling Vegetables: Gooseneck-type Magnifier
Icing a Cake: Gooseneck-type Magnifier

Entertainment:

Crossword Puzzles: C.C.T.V.
Gooseneck-type Magnifier

Family Photos:	C.C.T.V. Gooseneck-type Magnifier Headborne Magnifier (loupe)
Watching Movies:	Telescopic Sport Glasses
Watching Sport Events:	Telescopic Sport Glasses
Watching Theater:	Telescopic Sport Glasses
Watching T.V.:	Telescopic Sport Glasses
Hobbies:	
Building Models:	C.C.T.V. Gooseneck-type Magnifier Headborne Magnifier (loupe)
Coin Collection:	C.C.T.V. Gooseneck-type Magnifier Handheld Magnifier Headborne Magnifier (loupe)
Stamp Collection:	C.C.T.V. Gooseneck-type Magnifier Handheld Magnifier Headborne Magnifier (loupe)
Making and Repairing Fishing Gear:	C.C.T.V. Gooseneck-type Magnifier Headborne Magnifier (loupe)
Inspecting Production Materials:	Handheld Magnifier Headborne Magnifier (loupe)
Personal Grooming:	
Applying Make-up:	Illuminated Magnifying Mirror
Combing Hair:	Illuminated Magnifying Mirror
Hand Care: (applying nail polish)	Gooseneck-type Magnifier Neck-held Magnifier
Shaving:	Illuminated Magnifying Mirror
Reading:	
Books:	C.C.T.V. Large Print Stand Magnifier Typoscope
Bills:	C.C.T.V. Handheld Magnifier Stand Magnifier
Dictionary:	C.C.T.V. Handheld Magnifier Stand Magnifier Typoscope
Insulin Syringe:	Headborne Magnifier (loupe)

Labels and Price Tags: (shopping)	Handheld Magnifier
Menus in Dark Restaurants:	Illuminated Handheld Magnifier
Microfilm:	C.C.T.V.
Telephone Book:	C.C.T.V. Handheld Magnifier Stand Magnifier Typoscope
Thermometer:	Headborne Magnifier (loupe)
Repairing Small Engines:	C.C.T.V. Gooseneck-type Magnifier Headborne Magnifier
Sewing:	
Hand Sewing:	Gooseneck-type Magnifier Headborne Magnifier (loupe) Neck-held Magnifier
Machine Sewing:	C.C.T.V.
Threading a Needle:	Gooseneck-type Magnifier Headborne Magnifier (loupe) Self-threading Needle
Typing:	C.C.T.V.
Writing:	
Checks:	C.C.T.V. Gooseneck-type Magnifier
Filling Out Forms:	C.C.T.V. Gooseneck-type Magnifier
Writing Letters by Hand:	Bold Line Paper C.C.T.V. Felt Tip Pen Gooseneck Magnifier

It is hoped that this article will encourage rehabilitation teachers to use their ingenuity in incorporating low vision aids in the teachings of Activities of Daily Living.

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Low Vision Service of the Lighthouse, The New York Association for the Blind, Cat. of Optical Aids, 3rd Ed., 9.

ORIENTATION AND MOBILITY AND LOW VISION TRAINING WITHOUT AIDS: TRENDS AND NEEDS

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Introduction

The field of Orientation and Mobility and Low Vision is one which has only recently come into prominence. What follows represents the attempt to report on the needs and trends in the area of low vision mobility training. A cross-section of colleges and universities involved in the professional preparation of orientation and mobility specialists, and of orientation and mobility specialists employed at schools and agencies serving the visually handicapped, were contacted through open-ended telephone surveys.

According to recent statistics published by the American Foundation for the Blind, approximately 85% of the blind population range in visual acuity from light perception to 20/200. The parameters within which low vision is defined for the purposes of this report will reflect that range.

In dealing with the topic of orientation and mobility and low vision training without aids, a variety of concerns such as terminology, motivation, attitudes, training techniques, functional vision and perception come immediately to mind. Although there are topical limitations to this paper, I wish to emphasize that such concerns must be considered integral to the area of low vision and mobility training without aids, as they constitute a dynamic matrix within which any search for a comprehensive understanding must begin.

Colleges and Universities

1. Does your program include any formal orientation and mobility courses, seminars, or simulation activities dealing with low vision?

Yes 9 (Courses: 2; Seminars: 7)

2. Approximate the amount of time allocated for work pertinent to low vision aspects of orientation and mobility.

1-05 hrs.	2
6-10 hrs.	2
11-15 hrs.	2
16-20 hrs.	1
21-25 hrs.	2

3. Approximately what portion of the above time is spent in low vision simulation activities?

1-05 hrs.	6
6-10 hrs.	2
11-15 hrs.	1

The major areas of emphasis in the courses, seminars, and simulation activities were functional low vision evaluations for orientation and mobility purposes. The implications of diagnoses, fields, near and distant acuities and dynamic as well as static evaluations were stressed by all respondents. Included in the total program of a majority of the respondents were developmental aspects of vision, theories of visual perception and psycho-social aspects of low vision.

4. Do your students have experiences conducting night evaluations?

Yes 6 No 3

5. Does your program include any observations of, or coordination with low vision clinics?

Yes 6 No 3

6. Approximate the amount of student teaching and internship experiences with:

Low Vision Children	Low Vision Adults	
100%	0%	2
70%	30%	1
50%	50%	1
40%	60%	5

7. Approximate the amount of student teaching and internship experiences with:

Low Vision Ind.	Totally Blind Ind.	
90%	10%	1
80%	20%	1
75%	25%	1
70%	30%	1
65%	35%	1
60%	40%	1
50%	50%	3

None of the respondents have required of their students written notebooks of techniques for training low vision individuals. However, students do receive handouts, outlines, evaluation forms, and bibliographies related to low vision and mobility.

The following are representative of concerns expressed by staff members of colleges and universities involved in the professional preparation of orientation and mobility specialists:

1) Need for fuller understanding of unaffected visual perceptual systems, i.e., more orientation towards the perceptive and cognitive bases of what is restricted in low vision individuals.

2) Emphasis on not dealing with the eye as a separate organism but with the individual's entire perceptual system.

3) More representative simulation devices needed with stronger emphasis on night evaluations while working with these devices.

4) More conferences dealing specifically with orientation and mobility training for low vision individuals.

5) Need for more detailed information dealing with actual training techniques for the utilization and stimulation of low vision.

Summary

During the past decade, curricula and courses of studies in colleges and universities involved in the professional preparation of orientation and mobility specialists have concentrated heavily on blindfold training and content material stressing orientation and mobility for the totally blind individual. Time spent in simulation of total blindness is far greater than the average five hours allocated for simulation of low vision experiences.

In view of the recent statistics on blindness and the average percentage (66%) of actual orientation and mobility student teaching and intern experiences which involve low vision individuals, it is apparent that an inadequate amount of training and class time (average--12 hours) is being allocated to work pertinent to low vision aspects of orientation and mobility.

Functional low vision evaluations constitute the major thrust in course and seminar time. Orientation and mobility specialists are being trained to evaluate functional vision, with little emphasis on perceptual theories and developmental stages of vision. Where the low vision individual is now and how he functions can be pinpointed as a result of present levels of training. However, there exists a grossly inadequate understanding of how the low vision individual developed to this point and what specific training techniques can be implemented to improve his level of visual functioning. Simply stated, we know where he is but we don't have a full understanding of how he got there, nor do we know specifically what to do with him from that point.

Along with other courses, students are learning about the anatomy of the eye with the implications of various diseases, but a majority of the content work too often divorces itself from the individual's total perceptual system. We are not training an isolated sense when working with low vision individuals. Instead, we should be training individuals to establish a total perceptual equilibrium, which integrates whatever vision is present with all other sensory modalities.

Residential and Public Schools

1. Approximate percentage of low vision to totally blind students in your school.

Low Vision Students	Totally Blind Students	
95%	5%	3
85%	15%	1
80%	20%	1
70%	30%	1
60%	40%	2
50%	50%	1

2. Approximate percentage of low vision to totally blind students on orientation and mobility specialist's work schedule.

Low Vision Students	Totally Blind Students	
95%	5%	1
90%	10%	1
85%	15%	1
80%	20%	1
70%	30%	1
50%	50%	2

2. (Continued from previous page)

Low Vision Students	Totally Blind Students	
40%	60%	1
20%	80%	1

3. Do you have a specialized Orientation and Mobility program for low vision students?

Yes 6 No 3

4. Since their initial training in colleges, universities, or agencies, have any of your orientation and mobility specialists received additional training in the area of low vision?

Yes___ No 9

5. Do your orientation and mobility specialists utilize any curricula, manuals, or sequentialized lesson plans in orientation and mobility programming for low vision students?

Yes 6 No 3

6. Do your orientation and mobility specialists utilize methods of occlusion when working with low vision students?

Yes 3 No 6
Occasionally 1 Seldom 2

7. Of those students whom you feel could benefit from the use of low vision aids for orientation and mobility purposes, approximate percentage of those who are actually using them.

With Aids	Without Aids	
70%	30%	1
30%	70%	1
20%	80%	1
10%	90%	1
2%	98%	2
1%	99%	1
0%	100%	2

8. In comparison to time necessary for totally blind students to complete your Orientation and Mobility program, low vision students need:

Considerably Less Time	3
Less Time	1
More Time	3
Considerably More Time	2

9. Orientation and mobility specialists' method of reporting progress information:

Objective Forms Only	0
Narrative Commentaries Only	3
Both	6

10. Eye specialists involved in low vision screenings:

Ophthalmologists Only	6
Optometrists Only	0
Both	3

11. Are formal functional low vision evaluations conducted, and if so, by whom?

Yes 9 No 0

Conducted by orientation and mobility specialists 9

12. Within this evaluation procedure, are there any specific provisions for students' subjective input?

Yes 5 No 4

13. How often are these functional evaluations conducted?

Pre-post	6
Pre-interim-post	3

14. In what settings are evaluations conducted?

Indoors and Outdoors 9

15. Are there provisions for night evaluations?

Yes 8 No 1

Most respondents indicated very few night evaluations with frequency depending on the discretion of the individual orientation and mobility instructor. One respondent indicated that specific evaluations were conducted on each student in a variety of lighting and weather conditions.

16. Has your school conducted any inservices pertinent to the topic of low vision and mobility?

Yes 4 No 5

17. Do you maintain a follow-up procedure with your students?

Yes 3 No 6

18. Do you feel the orientation and mobility needs of the low vision child are being adequately met at your school?

Yes 3 No 6

The following are general statements made by orientation and mobility specialists working in nine U.S. residential and/or public schools serving visually handicapped children. The statements were made in response to questions on what low vision services they felt were lacking and what areas they felt should be stressed:

1) "There is a need for more instructors and low vision clinic access."

2) "I feel there should be further training of orientation and mobility instructors with emphasis on low vision and I would like to see a system for national exchange of program information."

3) "There is a lack of coordination with classroom teachers and anyone for that matter."

"We need more individual attention, especially with the younger low vision students."

"Many instructors would like to see a 2-6 week training course on aids and the whole topic of low vision and mobility."

4) "Services are not extended enough once the student leaves school. Few mobility services are provided."

5) "I feel low vision is a neglected area."

"More low vision kids should get mobility and more of these at a younger age. The philosophy unfortunately is 'He can wait because he can see'."

"The orientation and mobility instructor should be more involved with the ophthalmologist in low-vision evaluations."

6) "Some low vision students seem to have a psychological inability to learn. They maintain a self-image of a dependent person. We need to discourage over-protection by parents and work towards a major personality reorganization for the child."

"...begin lessons at a younger age to enable child to keep pace with sighted peers."

"...need for more night lessons."

7) "We need more information on techniques for multiply-handicapped low vision children and better low vision evaluation forms."

8) "The whole area of the use and training of low vision needs more attention." "Orientation and mobility instructors need to learn more about the use of distance aids."

9) "The personal needs of the low vision child are not being met."

"We need to coordinate visual information with other sensory information."

"There should be regional in-services to retrain teachers and orientation and mobility instructors in the use of near and distance low vision aids."

"We need stronger ties with the medical field."

Summary

The average percentage of low vision children on individual orientation and mobility specialists' work schedule is 65%. And there appears to be an increased awareness of the population of low vision children (average 67%) and the implications of the orientation and mobility problems. However, this survey indicates disagreements in the methodology of training the low vision child. Respondents disagreed on whether or not to use occluders with their students. And there was quite a discrepancy on the need for the recording of low vision students' subjective input and the time necessary for completion of the orientation and mobility program for low vision as opposed to totally blind students. Many of the orientation and mobility specialists' philosophies, however, were based on prior training that admittedly dealt merely on a surface level with low vision implications of orientation and mobility. None of the respondents or their fellow orientation and mobility staff members received additional specialized low vision instruction subsequent to their initial training.

An average of 85% of low vision students are reported to be functioning in orientation and mobility without the use of distance aids. It is, therefore, clear that the present levels of orientation and mobility and low vision training without the use of aids must be given a sound methodological and conceptual framework, particularly in light of the fact that the majority of respondents are working mainly with low vision students and have expressed frustration at the lack of information on training techniques and coordination of relevant services. Six of the nine respondents felt that the orientation and mobility needs of the low vision child were not being met at their respective schools.

A need for further training in the area of low vision, possibly through additional 2-6 week courses was indicated as a solution to the dilemma of those orientation and mobility specialists already working in the field. A desire for national exchange of information and a system for regional inservices to retrain teachers were additional suggestions concerning the problem.

Finally, two consistent areas of stress were the need for beginning orientation and mobility with low vision children at younger ages and providing for more thorough follow-up procedures.

Agencies

1. Approximate percentage of low vision to totally blind clients in your agency.

Low Vision Individuals	Totally Blind Individuals	
80%	20%	1
75%	25%	1
70%	30%	2
60%	40%	1
40%	60%	2

2. Approximate percentage of low vision to totally blind clients on orientation and mobility specialists' caseload.

Low Vision Clients	Totally Blind Clients	
75%	25%	1
70%	30%	2
60%	40%	1
40%	60%	1
35%	65%	1
Unable to estimate		1

3. Do you have a specialized orientation and mobility program for low vision clients?

Yes 7 No 0

4. Since their initial training in colleges, universities, or agencies, have any of your orientation and mobility specialists received additional training in the areas of low vision?

Yes 4 No 3

Additional Training by Ophthalmologist 1

Additional Training by Optometrist 3

5. Do your orientation and mobility specialists utilize any curricula, manuals, or sequentialized lesson plans in orientation and mobiliy programming for low vision students?

Yes 7 No 0

6. Do your orientation and mobility specialists utilize methods of occlusion when working with low vision clients?

Yes 7 No 0

7. Of those clients whom you feel could benefit from the use of low vision aids for orientation and mobility purposes, what is the approximate percentage of those actually using them?

With Aids	Without Aids	
98%	2%	1
90%	10%	1
70%	30%	2
40%	60%	1
30%	70%	1
5%	95%	1

8. In comparison to time necessary for a totally blind client to complete your orientation and mobility progam, low vision clients need:

Considerably Less Time 5
Less Time 1
More Time 1

9. Orientation and mobility specialists' method of reporting progress information:

Objective Forms Only 1
Narrative Commentaries Only 0
Both 6

10. Eye specialists involved in low vision screenings:

Ophthalmologist Only 4
Optometrist Only 0
Both 3

11. Are formal functional low vision evaluations conducted, and if so, by whom?

Orientation and Mobility Specialist Only 2
Orientation and Mobility Specialist and LV Specialist 4
Orientation and Mobility Specialist and Ophthalmologist 1
Yes 7 No 0

12. Within this evaluation procedure, are there any specific provisions for client's subjective input?

Yes 5 No 2

13. How often are these functional evaluations conducted?

Pre-Post 2
Pre-Interim-Post 5

14. In what settings are formal functional evaluations conducted?

Indoors Only	2
Indoors & Outdoors	5

15. Are there provisions for night evaluations?

Yes 5 No 2

16. Has your agency conducted any inservices pertinent to the topic of low vision and orientation and mobility?

Yes 4 No 3

17. Do you maintain a follow-up procedure with your clients?

Yes 4 No 3

18. Do you feel the orientation and mobility needs of the low vision client are being adequately met at your agency?

Yes 4 No 3

The following are general statements made by orientation and mobility specialists working with low vision persons in U.S. rehabilitation agencies serving the visually handicapped. The statements were made in response to questions on what low vision services they felt were lacking and what areas they felt should be stressed:

1) "I am an orientation and mobility instructor and personally I find working with low vision people is frustrating."

"Improvement can be had in this area and night evaluations should be stressed."

2) "We need more of a side-based knowledge with specific guidelines that can be followed."

"Night evaluations and follow-up need more stress."

3) "I am particularly concerned with those who don't get here, are put on waiting lists, and by the time they do get here, are functionally blind."

"Follow-up is not at the level it should be. Coordination is lacking."

"We need open meetings for exchange of information."

4) "There is a definite lack of knowledge in this area."

"Across the board, follow-up is poor."

5) "I would like to see low vision evaluations geared more towards the specific situation of the client. It is important to evaluate in the client's home and work setting before and after training."

6) "We need more of a comprehensive program to evaluate meeting their needs, i.e., more exposure to urban travel situations."

"The individual is the problem...their willingness to utilize what they are taught as opposed to trying to pretend they see better or worse."

"Even acceptance of the cane in certain limited situations is a problem. The client learns to be perceptive and cope while the instructor is present, but remove the instructor and he won't carry a cane."

Summary

Results of this survey indicate an average low vision population of 62%, with the average percentage of low vision clients on individual orientation and mobility specialists' caseload at 58%. In contrast to orientation and mobility specialists in schools, all agency respondents to this survey agree on the use of occlusion as a valuable teaching tool in specific circumstances with the low vision client. And a majority of agency respondents agree that it takes considerably less time for a low vision as opposed to a totally blind individual to complete the program. Also, a majority of the agency reports include the recording of clients' subjective input within their functional low vision evaluation forms. Whereas, since their initial training, the orientation and mobility specialists working in school systems had received no additional specialized instruction in the area of low vision, over half of the respondents to the agency survey had received additional instruction from either ophthalmologists or optometrists. This training is reflected in the average percentage (58%) of the clients who function in orientation and mobility with the use of distance aids.

Though the majority of respondents felt that the needs of their low vision clients were being fulfilled, feelings of frustration were consistently indicated at the lack of training in relevant situations, the lack of specific information concerning the low vision aspects of orientation and mobility, and the lack of coordination of available information and services. A desire for more open meetings in this area was expressed, an emphasis consistent with needs elicited by each survey.

Conclusion

Throughout the surveys, it is consistently evident that areas of need far outweigh present training and knowledge on the topic of orientation and mobility and low vision training without aids. The entire field of education and rehabilitation of the visually handicapped must come out of its sleepy insularity and strive toward an interdisciplinary approach to the problems of the low vision individual. Information on perceptual psychology, developmental aspects of vision, and implications for training, as well as approaches that seek to understand and fulfill the individual's needs as a total organism, are essential to the awakening of our field.

Haase, K.W.
Bryant, E.E.
1973

"Development of a Scale
Designed to Measure Functional
Distance Vision Loss Using an
Interview Technique"
Proceedings of the American
Statistical Assoc., Social
Statistics Section, 274-9

This paper presents a recent survey conducted by the National Center for Health Statistics in cooperation with the American Foundation for the Blind and the National Society for the Prevention of Blindness. The purpose of the study was to develop and test three scales designed to measure functional vision loss by the use of an interview technique. The scales consisted of a distance vision scale, a near vision scale, and a self-evaluation scale related to difficulty in seeing. The paper presents a preliminary assessment of the distance scale (used alone) and of the scale used in conjunction with the self-evluation scale.

Six eye clinics participated in the study allowing for a sample of 1,726 patients, all aged six years or older. Four acuity classes were used in the analysis. These were: better than 20/50, 20/50 to better than 20/100, 20/100 to better than 20/200, and 20/200 or worse. A total of 1,661 patients responded to the survey.

The distance scale consisted of five questions ordered in the form of a Guttman Scale. The questions were:

1) (When wearing glasses), can you see well enough to recognize a friend if you get close to his face?
2) (When wearing glasses), can you see well enough to recognize a friend who is an arm's length away?
3) (When wearing glasses), can you see well enough to recognize a friend across a room?
4) (When wearing glasses), can you see well enough to recognize a friend across a street?
5) Do you have any problems seeing distant objects?

In analyzing the responses to these five questions, it was found that the two extreme visual acuity classes yielded consistent responses. That is, the visual acuity classes of 20/40 or better visual acuity and 20/400 or worse visual acuity responded to the five questions as would be expected. The remaining two visual acuity classes showed great variation in their response to the five questions, with no central trend.

Two additional questions were asked in the form of a self-evaluation scale. These questions concerned vision in each eye separately, and were:

1) (When wearing glasses), how much trouble do you have in seeing with your left eye -- a lot of trouble, a little trouble, or

no trouble at all?

2) (When wearing glasses), how much trouble do you have in seeing with your right eye -- a lot of trouble, a little trouble, or no trouble at all?

The statistical treatment of these two questions (along with the previous five questions) yielded a slightly stronger association between the visual acuity classes and the questionnaire items than was possible with the distance scale alone. Nevertheless, the phi coefficient was only 0.36.

Thus, the questionnaire items show only a slight positive association with the four classes of visual acuity. Several variables may contribute to this. First of all, the four classes of visual acuity are gross, that is, a larger number of classes might have yielded more significant results. Secondly, it may be that other conditions than just visual acuity contributed to the visual problems. Visual field losses would seem to be an obvious example of such additional conditions.

Still, the questionnaire technique described is encouraging as a means of quickly measuring functional distance vision. Future improvements may well yield a simple, easily administered, and readily understood questionnaire which can be related to visual acuity measures and to potential need for further training (e.g. in mobility skills). The authors have plans to include the scale in the National Health Examination Survey to test it on the national population, and these results will hopefully reflect the scale's ability to test functional vision in a wide ranging population, not just a population already seeking eye care.

Mattingly, William
Orientation and Mobility Program
California State Univ. at Los Angeles
September, 1975
41 pages including bibliography
and appendices

"A Study to Evaluate the
Effectiveness of an Intervention of Utilization
of Residual Vision on the
Independent Mobility of
Persons With Low Vision"

Although individuals in orientation and mobility have evolved training programs for low vision persons since 1970, no single body of generally accepted "best practice" has been defined. Mattingly suggests a model of investigation that he feels could begin to provide a list of proven standardized applications of residual vision for mobility purposes. Such a list could serve as guidelines for individualized programming for low vision students.

Mattingly suggests a pretest - post-test control group design to investigate whether techniques for using residual vision improves efficiency of independent mobility in a residential setting. The subjects would be drawn from a population of low vision persons within the acuity range 1/200 to 20/200 who have had orientation and mobility training and rely on use of the long cane. Some of the author's additional criteria for selection of subjects would appear to be difficult to meet (i.e. full field of vision, and no other visual conditions such as photophobia or fluctuating vision.) The pretest consists of the subjects walking a predetermined route three times independently. They may use any techniques they wish, but no optical aids. Time and safety scores are recorded. The post-test, which is administered immediately following completion of five hours of treatment, is identical to the pretest. A questionnaire is also administered to the experimental group following the post-test. Such a questionnaire might reveal new ways to use residual vision. The treatment program generally consists of instructing the low vision person to visually attend to the contrast of walking surfaces and shorelines in order to maintain straight line of travel, and locate intersecting sidewalks and curbs.

The following is a sample of data to be collected on the questionnaire:

QUESTIONS:	Did the following make your travel faster?		easier?		safer?	
	yes	no	yes	no	yes	no
Sidewalk Travel						
A. Touch techniques to protect footpath.						
B. Visually following contrast of parkway/sidewalk to maintain straight line of travel.						
C. Gaze at 30° from vertical to best see parkway/sidewalk contrast.						

Did you use any of the treatment methods before they were shown to you? Yes___ No___ If yes, list them:

Can you think of any other uses (other than those suggested) of your vision that would make your travel faster, easier, or safer? List them (include why you think the method would be better.)

Which methods that were shown to you will you continue to use?

Meyerson, Nancy
Orientation and Mobility Program
Western Michigan University
December 1975
10 pages, including Bibliography

"Aspects Limiting Successful Use of Aids by Low Vision Individuals"

The author expands the usual definition of legal blindness (e.g. visual acuity with best correction of 20/200 or less, and/or a visual field not exceeding 20°) to include those with visual acuities of 20/70 (or less), and/or visual fields not exceeding 30°. Thus, she is able to discuss the problems of many elderly persons who, while not legally blind, must adjust to the use of aids or to a more restricted visual perception of the environment. The author proceeds to recommend an individual approach to low vision individuals, with a variety of factors requiring attention. Among these factors are: general health, age, manual coordination, I.Q., culture, and personality.

Meyerson notes that only about 30% of low vision patients over 70 years of age use optical aids. It appears that the value gained by reading (with a working distance of 1", in some cases) is not sufficient motivation. In these cases, alternatives should be explored (e.g. talking books, tape recorders, radio, etc.). Additional complications can lead to the same lack of interest in reading, for example, cerebral palsy, multiple sclerosis, and so on. Here, the attenuated working distance is complicated by the difficulty or inability to steadily hold the aid or material to be read.

Social and cultural values may also affect an individual's willingness to utilize an optical aid. Individuals raised in many cultural groups view the male as "family leader", and the use of some optical aids may be seen by the man (and perhaps his family) as threatening his traditional leadership role. As Glass (1972) stated the effect, "...partial loss of sight chips away at his former position and is substituted by a dependent role".

Other personality variables can play a role in the acceptance or rejection of low vision aids. The increased incidence of psychosis and mental retardation has been noted by some, and the rapidity with which vision is lost appears to be related to the individual's ability to adjust to his new and reduced visual abilities.

Consideration of these variables leads to a number of conclusions relevant to those individuals working with the low vision individual. Among those mentioned by the author are: 1) the need to help the individual change his self-image to conform with his capabilities, 2) the need to emphasis success in various tasks, rather than emphasizing failure, and 3) the need to help the individual alter his life-style to encompass his abilities. These needs are also discussed in terms of the three personality types proposed by Glass.

In summary, the paper is not a complete discussion of all variables affecting the adjustment to low vision aids, nor are the variables exhaustively treated. It does contain a good functional approach to the problems, and the paper and bibliographies should prove useful to those interested in the adjustment of low vision aids.

Shibata, Hirokazu
Orientation and Mobility Program
Western Michigan University
August 1975

"Visual Training and
Mobility Training for
the Person With Low
Vision"

The 43 pages of text in this literature review are organized into five chapters consisting of: Introduction, Perceptual System, Eye Diseases, Visual Training, and Mobility Training. Shibata has attempted to write the review in a step-wise pattern so that each level is integrated into the next, and to an extent, he has accomplished this. The major strength of the work lies in it's bibliography of 32 references, which form an excellent reading list for anyone interested in Low Vision as it relates to Orientation and Mobility.

The chapter on Perceptual Systems contains references to visual sensation, visual perception, attention, motion, space, and color. These topics have been related to behavioral variables to place them in a context more appropriate to the orientation and mobility setting, however, in doing so, Shibata has occasionally lost some precision in his definitions. In treating eye diseases, the author concentrated on glaucoma, cataract, diabetic retinopathy and field defects. Such limitations are necessary due to the number of pathologies, and by singling out these four, he has given examples of visual losses due to intraocular pressure changes, media impairment, and retinal damage.

Visual training methods and mobility training methods, as reviewed by Shibata, are both related to practical training tasks, rather than theoretical methods. Thus, the work has the advantage of being readily applicable to low vision training, and the limitation inherent in the lack of precise definitions. Shibata has reviewed numerous references relating to low vision training, and this review and accompanying bibliography may constitute a handy reference guide to the literature.

EDITORIAL:

Here is the new editorial policy for the Low Vision Abstracts. In keeping with our changes recommended to you in the last issue, the Abstracts is opening it's doors to near vision. New contributing editors have joined us from university-based teacher preparation programs with the understanding that they would contribute papers written by their students and colleagues, and join the ranks of contributing editors from the program's training orientation and mobility specialists.

A prime requirement for consideration in the Abstracts is that subject refer to teaching of use of residual vision, and physical and perceptual phenomena directly affecting the learning of a person with low vision for either distance or near vision. Preference is given to papers which show originality, either in library research, research design or in research practice. A person need not be devoted to research if they contain "best practice" in a curriculum forum.

We would tend to exclude from the Abstract those kinds of literature for which an adequate forum exists. We would not consider information on new eye operations or new lenses or low vision devices unless they were a minor part of a paper which dealt with learning to use residual vision. I think we might be interested in articles which have neurological content if it was related to the learning of a visual task or phenomena which directly affects the learning of a visual task. I hope this editorial policy is clear to our contributors. Send us your papers and share with us your thinking.

Research Topics

I have run completely out of steam on developing topics for the Abstracts and am no longer in a clinical setting where such topics come easily based on daily experience. If our readers will send research topics to me, I will ask the contributing editors to review them for the Low Vision Abstracts.

Contributing Editors

The contributing editors whose names grace the front page of these Abstracts are some of the most outstanding people in the field of work with low vision individuals. In addition, they are friends and esteemed colleagues. It pains me greatly to notify them through these pages that if we receive no abstractable papers or publishable features for a period of four issues of the Abstracts or two academic years, we will consider that you are not contributing. We will not conclude that you are inactive with respect to the teaching of persons with low vision or in the development of teachers knowledgeable in the teaching of persons with low vision. We also have a liberal re-instatement policy.

I. E. A.

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Dosch, T. G. "A Study of Low Visual Acuity and Reduced Fields in a Residential Home for the Elderly," 1973. 27 pages

Ehrnest, S. F. "The Low Vision Evaluation Kit," 1974. 34 pages

Floyd, J. M. "The Low Vision Client in Relation to Orientation and Mobility," 1972. 30 pages

Hagen, M. E. "Can a Colorblind Subject Be Trained to Identify Colors by Discriminating Among the Shades of Grey or Color Which He Perceives?" 1971. 10 pages

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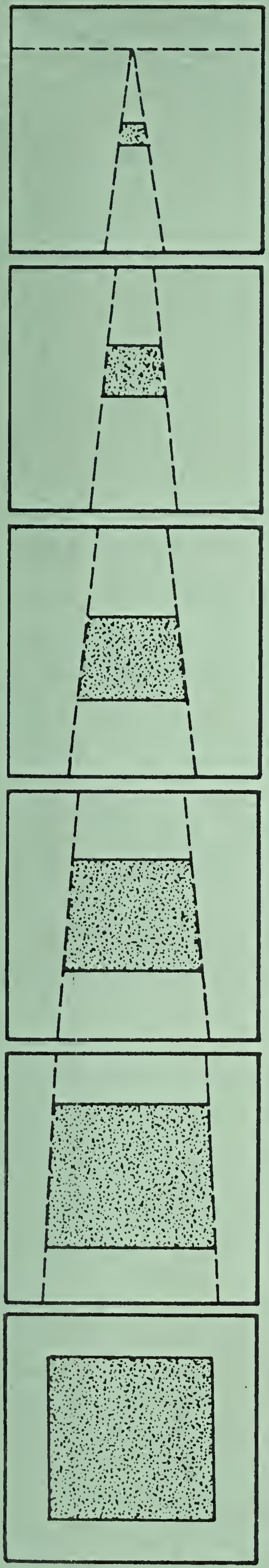

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LOW VISION ABSTRACTS promotes the information needs and skill growth within the areas of teaching the use of residual vision for low vision children or adults. When it began in 1971, the ABSTRACTS emphasized distance vision which drew the attention of orientation and mobility specialists. In 1976 the scope was broadened to include all areas of learning and phenomena which are related to low vision, both near and distance. This approach is designed to be of more use to the classroom teacher, the rehabilitation teacher and the rehabilitation counselor.

LOW VISION ABSTRACTS contains feature articles which deal with either research or practice, abstracts from the literature in the field, bibliographies and suggested research topics. The ABSTRACTS does not deal with optical aids as such, or pathology as such, since both these areas have their own well-developed literature.

LOW VISION ABSTRACTS is supported by students and faculty in both graduate and undergraduate programs of teacher preparation in the areas of blindness and visual impairment. Assistance to, and stimulation of work at this level is the basic commitment of the ABSTRACTS.

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CONTENTS

FEATURE ARTICLES

Some Psychophysical Considerations for Visual Training
Chris A. Johnson, Ph.D...... 1

The Artificial Reduction of Visual Cues as a Means of Preparing Training Programs for Low Vision Clients
Loyal Apple, Marianne M. Apple, Donald Blasch........ 4

Evaluation of Visual Function
Richard E. Hoover, M.D...... 6

ABSTRACTS

A Report on the Incorporation of Low Vision Aids into the Orientation and Mobility Program of Low Vision Clients.... 8

Image Intensification: A Night Vision Aid for Nyctalopia......................... 8

An Evaluation of a Research Information Dissemination and Translation Vehicle: Special Study Institutes on Utilization of Low Vision............ 8

Eccentric Viewing Training.... 9

Low Vision Practicum.......... 10

A Guide for Training Clients to Utilize Low Vision Distance Aids for Mobility............ 10

CURRENT BIBLIOGRAPHY............. 12

LVA COPY REFERENCE SERVICE........ 17

COVER:

The illustration is of successive transformations of the image of a square of pavement while a person is walking along a street. It was sketched from a figure given by J.J.Gibson in The Perception of the Visual World. "A transformation is a regular and lawful event which leaves certain properties of the pattern invariant."

The motif of Low Vision Abstracts is TRANSFORMATION of mobility, rehabilitation, and classroom teaching through an increased understanding of the visual environment of the low vision person.

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SOME PSYCHOPHYSICAL CONSIDERATIONS FOR VISUAL TRAINING

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It is important that differences between foveal and peripheral processing of visual information be recognized. The periphery should not be regarded as merely a region in which visual functions are degraded with respect to foveal performance; rather, foveal and peripheral vision may be considered as subserving different, yet complimentary functional roles. Thus, the relevant or important factors affecting foveal performance are not necessarily important for peripheral vision, and vice versa.

With regard to evaluating the status of function throughout the visual fields, it is useful to consider several current additions to the standard clinical methods of perimetry and visual field testing. Three new psychophysical tests (the "Westheimer" function, the "transient-like" function, and the "repeat-static" test) have recently been adapted to the quantitative perimeter.[1-3] The procedures are relatively quick and simple to perform, thus providing a useful supplement to standard kinetic and static perimetry. The Westheimer and transient-like functions reflect retinal receptive field-like properties, displaying a central summation-like region surrounded by an annular inhibition-like zone. Post-retinal events may be evaluated with the repeat-static test. Together these tests make it possible to draw distinctions among outer retinal pathology, inner retinal pathology, and lesions at or central to the optic nerve head. This provides precise information regarding the locus of visual response alterations at successive levels within the visual system. To date, these procedures have been valuable in localizing the site of specific response changes produced by pathology, analyzing and following the course of various disease states, and in evaluating the efficacy of various therapeutic regimens. Since an accurate assessment of visual function and capabilities is necessary for visual training, this approach appears to be a most fruitful and promising one.

A careful consideration of refractive error and blur is also essential in order to differentiate between optical and neural limitations on visual performance. Perimetric and visual field examinations can be greatly affected by the presence of blur. At a given locus in the visual field, uncorrected errors in refraction will often reveal an apparent relative loss in visual sensitivity ("refraction scotomata").[4,5] Under such conditions, it is difficult to distinguish between deficits associated with neural and optical factors. It is thus necessary to minimize blur to adequately evaluate neural properties. Since dioptric characteristics exhibit considerable variation as a function of visual eccentricity from the fovea, blur should be minimized for each individual locus examined in the visual field. The elimination of refractive errors also reduces variability among individuals for a number of visual functions, thereby providing a more refined basis for the comparison of findings among various normal, as well as low vision populations.

Two Visual Systems Theory

The "two visual systems" theory is an intriguing concept, particularly with regard to functional properties of the visual system, and problems associated with visually-guided behavior. Basically, the two visual systems hypothesis states that there are two modes of processing visual information; one which is concerned with the identification of visual stimuli by analysis of form and contour, and is primarily foveal and mediated by cortical mechanisms, and a second system concerned with localization and orientation, mediated by subcortical mechanisms and predominantly a function of peripheral vision. These two processing modes may be regarded as "what" and "where" systems respectively, although it should be noted that this dichotomy is relative rather than absolute, and is intended as a heuristic model for classifying visual function.

The implications of this concept appear to be quite promising, since by examining the mobility behavior of individuals with low vision, it may be possible to develop important new methods and skills for use with existing visual training techniques. To date, the two visual systems hypothesis has been extremely valuable in understanding the visually-guided behavior of observers during adaptation to prisms, visual rearrangement, and other visual-motor skills.[6] Thus, the analysis of visual-motor coordination with due consideration of the two visual systems concept is likely to provide new valuable insights for visual training. In this view, visual-vestibular and other cross-modal visual interactions should be considered, both with regard to the two visual systems concept and in relation to perceptual learning and visual training.

Perceptual Learning and Practice Effects

A discussion of many aspects of perceptual learning and visual training of functional properties in the periphery has been previously presented by Leibowitz.[7] In this paper, several additional considerations of visual acuity, motion perception, and absolute thresholds in the peripheral visual fields are presented.

An important aspect of the effects of practice on peripheral visual function concerns their time characteristics. For both absolute threasholds[8] and motion detection[9] in the periphery, a small amount of appropriate practice and feedback of results (four to five sessions of about one hour duration each) will produce dramatic improvements in performance in the periphery. In addition, it appears that improvements with practice for peripheral motion thresholds can be maintained for relatively long periods of time. One month after practice sessions were completed, peripheral motion thresholds were only slightly higher than those obtained during the final practice session, and after three months, the effects of practice were still clearly present, although thresholds had become slightly higher.[9] These findings indicate that practice effects in the periphery are reasonably long-lasting suggesting that appropriate visual training procedures may greatly enhance visual performance, with a minimum of retraining necessary to maintain the enhanced performance.

Another topic pertaining to perceptual learning in the periphery is derived from investigations of peripheral visual acuity.[10] During the course of extensive training on a peripheral visual acuity task, many subjects reported a greater overall awareness of objects and stimuli in the peripheral visual fields. This extended to their day-to-day activities outside of the laboratory environment, thus indicating an enhancement of overall, general peripheral visual functioning. This shows that, to at least some extent, improvements with practice on a specific task in the periphery will generalize to other visual performance characteristics in the periphery. The implication of this finding is that individuals may learn to develop a "strategy" for optimizing the acquisition of visual information in the periphery, which is not bound to a specific function or task.

In conjunction with the effects of practice on peripheral visual performance, the concept of attention is also of importance. Current findings indicate that performance is better when attention can be directed to a known, discrete portion of the visual field than when it must be distributed over the entire visual field.[11] Hence, performance increases as the uncertainty of the stimulus position is reduced. Depending upon the particular working environment, tasks to be performed, and demands upon the individual, appropriate training procedures which allow the individual to concentrate attention to a specific portion of the visual field may be of great value.

A final perceptual learning consideration pertains to the effects of providing feedback as to performance following each trial of practice. With practice alone, improvements in peripheral motion detection were reported to be at a near-maximal level after approximately four sessions.[9] Additional sessions, in which feedback was provided in conjunction with practice, resulted in further significant improvements in peripheral motion detection. As with practice alone, performance reached a generally optimal level within about four sessions. Thus, practice with feedback produces improvements beyond those obtained with just practice alone. Presumably, the additional information provided by feedback allows the individual to extract the most important and relevant cues for performing the particular visual task.

In conclusion, it appears that the two visual systems concept, visual-vestibular and other cross-modal interactions, perceptual learning, and due consideration of relevant stimulus attributes (blur, luminance, etc.) may be of great importance to low vision training. It is within these areas that the visual scientist in psychophysics and related disciplines may be able to make a meaningful contribution to the problems associated with the mobility requirements of individuals with low vision.

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The Spring 1977 issue of Low Vision Abstracts will feature a training program "Utilization of Visual Information Functional Signs".

THE ARTIFICIAL REDUCTION OF VISUAL CUES AS A MEANS OF PREPARING TRAINING PROGRAMS FOR LOW VISION CLIENTS

By
Loyal Apple[*], Marianne May Apple[**] & Donald Blasch[***]

Introduction

Several university training programs are making use of visual reduction equipment to aid the mobility specialist to better understand the learning experiences possible with severely reduced or distorted visual information. Merriam-Webster (1969) defined a simulator as "a laboratory device that enables the operator to reproduce under test conditions phenomenon likely to occur in actual performance." Rice defined simulation as "a process that involves the participant in decision-making, often under emotional conditions that intensify his motivation." (Blasch, B.) Use of vision reduction equipment has a two-fold purpose. It reproduces in a limited way some of the physical appearance of the environment under conditions of reduced vision. This experience is important in evaluation. Vision reduction equipment provides validity of observation. It also aids the mobility specialist in developing optimism when he is able to experience the kind of learning that takes place as a result of practice and training. This "learning to cope with the limited visual world" experience is important in teaching. The two purposes of vision reduction equipment cannot be cleanly separated.

Recent Experimentation

Some of the more extensive recent experiments on visual distortion were conducted by Kohler in the early 1950's, and Doezal in 1975, using optical devices to create inversion, reversal and angular displacement of the retinal image. Kohler concluded that the sense organs were living variable systems, the functioning of which is subject to variation. Kohler assumed that the test subjects would eventually completely adapt to experimental displacement. His experiments also indicated some of the conditions under which perceptual adaptation can take place. (Kohler)

Doezal represents the most recent follow-up on Kohler's work with up-down reversal of the retinal image using prisms. During a five week period, Doezal repeated fifty planned observations daily, some of which were: eating, reading, recognition of others, playing chess, driving, and playing soccer. (Doezal) Doezal was interested in the immediate behavior consequences of looking through up-down reversing prisms and, the nature of the information responsible for perceptual and behavior adaptation.

The first report of work with visual distortion in which the retinal image was degraded through the use of lenses was by Bruce Blasch. Blasch describes the use of lenses to reduce acuity and fields of normally sighted persons to acuities of 20/200, 10/200, 5/200 and 2/200. A process was also used to simulate a fragmental field, 20° field, 10° field, and central scotoma. After reviewing mobility tasks done with the aid of such equipment, Blasch recommended instructional simulation of low vision for professional training programs.

In 1970 Apple and Apple at the Western Blind Rehabilitation Program, VAH, Palo Alto, California, used coated lenses to reduce acuity and templates to reduce peripheral fields for purposes of professional in-service training. Acuities possible ranged from 20/70 to 5/200 and fields were 3° to 20°. Each mobility specialist participated in mobility runs and kick ball games for approximately five hours. Basic purpose of the training was to learn to adapt performance to degraded visual information. After five hours of participation, improvement was noted in all. Later the vision reduction equipment was used to develop lesson plans and evaluation procedures.

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Caveats and Technical Possibilities

There are certain caveats and technical possibilities for the use of vision reduction equipment. Equipment in the present state of the art can reproduce only loss of visual acuity as measured by the Snellen chart and loss of peripheral field and should not be thought to reproduce or simulate any known eye condition. This equipment cannot reproduce visual fatigue, floaters, phosphenes, eye discomfort or photophobia, central or scattered scotomas, and hemianopsia. Technically, the equipment does not reduce visual acuity but degrades visual stimulus so that it is equivalent to a loss in visual acuity as measured by the Snellen chart. The normally seeing eye is looking at an image which is an extremely poor transmission of the visual environment when it is looking through the lenses of vision reduction equipment.

There are several desirable characteristics for vision reduction equipment. The carrier should allow for a complete field. The visual angle within most low vision goggles is quite a bit less than the normal 180 degrees and, of course, a great deal less when the low vision goggles are set for peripheral field loss and users will find that because of restricted field in either case will have to substitute head movements or head and eye movements for normal eye movements. The user should be able to wear his own glasses comfortably under the equipment. The equipment should permit for ventilation without allowing light through the carrier. The equipment should be lightweight and durable. The lenses should be easily changeable to alter visual conditions viewed. Goggles on which there is a frosting should have the frosting on the inside to prevent smudging and soiling which result from handling.

The development of vision reduction equipment centers on three elements: (carrier, acuity reduction panels, and field reduction panels). The protective gear used in acetylene welding, either goggles with separate eye pieces or mono-goggles, have been the equipment of choice thus far for carrier. Acuity panels have been made by modifying the light transmitting qualities of plano lenses. The early efforts used clear fingernail polish painted in a cross-hatched pattern. Later efforts used mylar sprayed with pastel fixative (available through art stores) to diffuse light. More recently, fresnel press-on lenses or high magnification lenses have been used to change the focal length. Field reduction panels have been produced in several ways. Opaque templates with the hole centered can involve only one eye and must rely on perimetry to insure accuracy. Small pouring funnels attached to carriers have been utilized by the Carters, mobility specialists in New Hampshire; the end of the funnel is snipped to change size of field loss.

Training Activities

There are certain kinds of activities which should be used for practice with vision reduction equipment. A single experience with any of these tasks is not sufficient. Two or more sessions are necessary to assure the user that not only can he find a way of accomplishing the task, but that he can develop skill. Users will notice the differences that lighting conditions make in practicing the following tasks: (1) activities of daily living - eating, dressing, cooking; (2) games with volley ball or soccer ball, using balls of different color and/or ball with a sound source. Play catch by rolling ball on floor, and by tossing. Play kickball; (3) standard orientation and mobility lessons - ascending and descending stairs, use of cane, and mobility routes.(Natl. Mobility Centre)

Conclusion

It is a strategic error to conceptualize vision reduction equipment as reproducing in any way a diagnosed low vision condition. To so contemplate loses sight of the main importance of vision reduction equipment, personnel training and program planning. When an instructor wears vision reduction equipment, he is not seeing the world in the same way his client is, and no amount of technical know-how will enable him to do so. The strength and importance of vision reduction equipment has been stated. Controlled use is advocated because of the danger of premature or erroneous conclusions as to the benefits to be drawn from such gear. Even with the technical imperfection and caution necessary, it is important to continue the development of such equipment to a more reasonable level of sophistication commensurate with the needs of the field in personnel training and program planning.

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EVALUATION OF VISUAL FUNCTION

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We have lived for a long time with the "almost-all-or-none" definition of blindness. As a consequence, the term blindness means many things to many people. Since this has created a situation in which there is an arbitrary cut off point between having a problem with seeing and being "blind", we have asked the ophthalmologist to determine who is "blind" and more or less arbitrarily restricted his role in the system of rehabilitation to objective measurements of distance acuity and perhaps fields.

If there was some system whereby every person with any kind of eye, health or visual problem would receive just as much emphasis on rehabilitation, restoration, prevention, training and evaluation, then the ophthalmologist would be tied into the system without a distinction between his role and that of the mobility specialist or any other rehabilitation worker. Thus it might become possible to have measurements of some value in assessing visual ability for a relatively important group of severely visually impaired people.

If cardiac surgery is contemplated as a rehabilitation measure in a severely impaired cardiac person, more than a pulse rate and blood pressure are required for rehabilitation planning. Why should only a distance visual acuity taken under haphazard conditions by less than exact examiners and/or a non-standard visual field examination determine rehabilitation potential for the individual who has a severe visual problem?

A reasonable proposal appeals to me for the creation of a system whereby all clinical examinations of the sense of vision, using standard and stipulated procedures, instrumentation and test conditions of environment, would be expressed in measurements uniformly recorded as deviations from some arbitrary definition of "normal." Soon there would be collected a body of data which might make it possible to correlate "visual impairment" with "visual ability." The measurement of visual impairment can be much more exact than visual ability, but without a comprehensive measurement and proper recording of the first, there will be no hope of correlating it with the latter.

For a more complete and detailed explanation of such a system*, it is suggested that no more careful work exists than that of "Classification of Impairment of Visual Function" by Maya Riviere under Grant Number NB05398, National Institute of Neurological Diseases and Blindness, 1968.

*It is also recommended as appropriate, a review of this same philosophy as outlined in: Richard E. Hoover, "Visual Efficiency as a Criterion for Service Needs" given at the thirty-fifth convention of the American Association of Workers for the Blind, Inc., 1962.

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PEABODY ORIENTATION AND MOBILITY PROJECT FOR MULTIPLY HANDICAPPED LOW VISION CHILDREN

A new research project was initiated in September at George Peabody College for Teachers in the development of programmed instruction in orientation and mobility for multiply handicapped low vision children. The objectives of this study are to develop and to validate a programmed intervention system in visual orientation and mobility for multiply impaired low vision children who are not currently using their residual vision for efficient independent indoor travel. The intervention system will consist of assessment and programmed instruction components designed to be used by classroom teachers and parents. The assessment instrument will be designed to evaluate children's skills in efficient utilization of their residual vision for negotiating their environments.

The programmed intervention component will consist of training programs in the fundamental visual utilization skill areas such as discrimination, recognition, visual recall, visual tracking and scanning, visual-motor coordination, visual utilization of landmarks. Each lesson will be programmed in small sequential steps with directions to the teacher or parent showing when to give commands, reinforce, repeat steps, or proceed to the next step. The programmed instruction component and the assessment instrument will be incorporated into a manual or instructional package to facilitate dissemination to parents and teachers.

The project staff would appreciate any information related to the development of materials in pre-cane orientation and mobility for multiply impaired low vision children.

Please write to:

Dr. Randall K. Harley
Project Director

or

Dr. John B. Merbler
Project Coordinator
Box 512
George Peabody College for Teachers
Nashville, Tennessee 37203

02476-01

A Report on the Incorporation of Low Vision Aids into the Orientation and Mobility Program of Low Vision Clients. CORY, Dennis and PRINCE, John. Orientation and Mobility Program, Western Michigan University, Fall 1975. 64p. including illustrations and bibliography.

The lesson plan sequence outlined in this report of a summer mobility program at the Michigan School for the Blind should be of interest to mobility specialists, low vision aid therapists, and optometrists who are involved in developing training programs in the use of low vision optical aids. The lesson plans are based on the principle that learning experiences are central to perceptual development and visual functioning can be improved through training. The program's objectives were to accurately evaluate the clients in regard to low vision aid prescription and to prepare structured lesson plans for travel training utilizing the aids. The evaluation phase included low vision clinical evaluation, and indoor and outdoor performance without low vision aids similar to the Hines (VAH) and Perkins School formats. The 4 children evaluated had acuities of 20/200 and visual fields ranging from unmeasurable to 120°; of the 3 children who had no previous mobility training, long cane was recommended for one for night travel; the 4th child used a collapsible cane. Low vision aids used include: Selsi 2.5x 26mm (focusable), Swift (Huntscope) 4x monocular (non-focusable), Selsi 6x 30mm monocular (focusable), and Selsi 6x 18mm and 8x 24mm monoculars (focusable). Lesson plan sequence is divided into 3 main sections: 1) training (indoor and campus), 2) residential, 3) business. The 17 lesson plans are representative of basic types of locations and can be easily transferable to other locations. While a limited number of aids were used, these lessons serve as a useful foundation for mobility training with other types of low vision aids or without low vision aids. The lesson plans are very well organized and the observations at the end of each lesson plan are particularly rich in techniques and suggestions.

(M.M.A.)

02476-02

Image Intensification: A Night Vision Aid for Nyctalopia. MIYAKI, Lawrence N. So. California College of Optometry, March 1975.

Night blindness is associated with loss of rod function. Light intensification units are designed to amplify light to levels allowing cone function while viewing through the device. The image intensification unit used in this study is an Apollo Lasers Model 221 Night Viewing Device designed for monocular viewing. Clinical testing of the instrument was made on the basis of visual performance as measured by visual acuity under four luminance levels. Participants included 3 normal subjects and 18 subjects with demonstrated light sense deficit (ie. retinitis pigmentosa, chorioretinitis, optic atrophy). Seventeen of the 18 subjects demonstrated improvement in visual acuities with the aid of image intensification. Under dim conditions, the subjects tested approximately 1 line below unaided photopic visual acuity. Preferred output luminance through the intensifier and optimal subjective output gain were also calculated. The author discusses design considerations necessary to make the instrument practical as a mobility aid and suggests areas of further research.

(M.M.A.)

02476-03

An Evaluation of a Research Information Dissemination and Translation Vehicle: Special Study Institutes on Utilization of Low Vision. OZIAS, Douglas K. Univ. of Texas at Austin, 1975.

The first fifteen Special Study Institutes on Utilization of Low Vision were a national effort to translate and disseminate a selected research finding to classroom teachers. A major purpose of this study was to describe and evaluate the impact of the Special Study Institute model in terms of (1) selected characteristics of teachers trained, (2) their reactions to institute attendance, (3) subsequent delivery of direct services to visually handicapped children, (4) occurrence of second generation information dissemination efforts by institute participants, and (5) teacher participant appraisal of the materials generated to support this effort. Related literature was reviewed with attention to the importance of descriptive evaluation research related to decision-making processes in educational program development. Additional information from the literature provided a historical perspective of the Utilization of Low Vision Concept and the Special Study Institutes on Utilization of Low Vision effort supported by the Bureau for Education of the Handicapped, United States Office of Education, to translate and disseminate information on the concept to teachers. The method used to obtain the desired information was the administration and interpretation of a survey of institute teacher-participants. A total of one hundred forty-seven teachers participated in the study. One hundred twenty-six teachers returned completed questionnaires which constituted the basic data, and another twenty-one respondents provided supplemental information related to the study. Examination of the data provided evidence for the following conclusions: (1) The teacher-participants were experienced in teaching, diverse with respect to their professional roles, and distributed nationally by number in close approximation to the population distribution of visually handicapped children. (2) Teacher-participants indicated highly positive reaction to the Special Study Institute model as an information translation and dissemination vehicle. (3) Use of the Special Study Institute model resulted in delivery of direct services by participants to low vision children. (4) One in three institute participants indicated involvement in second generation information dissemination activities with other teachers on Utilization of Low Vision. (5) The inclusion of tangible supportive materials such as the Utilization of Low Vision Kit was an effective adjunct to the Special Study Institute model. (6) Finally, the Special Study Institute model was an effective vehicle for the translation and dissemination of the Utilization of Low Vision concept. Suggestions for further study include: (1) investigation of the criteria used to select institute participants to ensure realization of institute goals; (2) repetition of a similar effort with a more highly structured institute format to increase the effectiveness of the Special Study Institute model; (3) replication of institutes on a local level to ascertain whether the institute model would generalize and be of value on a smaller scale; (4) refinement and field testing of the Utilization of Low Vision Kit as suggested by survey respondents; and (5) initiate a child-centered investigation of the long-term effects of the application of Utilization of Low Vision concepts by teachers.

(Author)

02476-04

Eccentric Viewing Training. HOLCOMB, Judith G. & GOODRICH, Gregory L., J. Amer. Optom. Assoc., Nov. 1976, 47 (11). Western Blind Rehabilitation Center, Veterans Administration Hosp., Palo Alto, California.

As presented in this research project, eccentric viewing refers to the utilization of the peripheral retina to search for, locate, and identify various objects in the environment. This active process can be differentiated from eccentric fixation, which refers to a steady visual fixation of an object with the peripheral retina. Prior to this work, it appeared to be widely assumed that one could teach the use of the peripheral retina to individuals who had lost the use of the central visual field. Indeed, there is a wealth of such subjective reports, but a dearth of objective findings. The goals of the eccentric viewing project, therefore, were 1) to develop such a training technique(s) and 2) to objectively measure the changes in peripheral viewing ability resulting from such training. A further limitation was that the techniques developed should be inexpensive and readily incorporated into a low-vision clinic program. Two eccentric viewing techniques were developed and training was carried out with seven subjects. A tachistoscopic letter identification task was used in the measurement of changes in peripheral viewing ability. Prior testing had indicated such measurement, in itself, did not produce changes in eccentric viewing ability. Both training techniques relied heavily upon initial visual field measurements to determine the location of the optimum retinal area to be utilized in training and were carried out in three training sessions (½-hour length) per week over a four-week period. The first technique utilized a strobe to place an after-image on the retina, so that it formed a "marker" for the subject to use in learning to eccentrically view targets. This technique requires a good deal of communication and cooperation between clinician and subject to properly place the after-image. The second technique consisted of the subject practicing eccentric viewing under the guidance of the clinician, and no after-image was used. The first technique resulted in measurable improvements in all subjects, while the second resulted in improvements in two of four subjects. The two subjects no showing improvement were subsequently trained with the first (strobe) technique and did show improved eccentric viewing. Both techniques, therefore, show promise for training eccentric viewing in patients with central scotomas; however, the strobe technique appears to be the most consistent. The authors note the continuing need for development and testing of similar techniques, and hope their study will be useful to those interested in such work.

(G.G.)

02476-05

Low Vision Practicum. NATL. MOBILITY CENTRE, "Report on Course Conference-Low Vision Training for Mobility Purpose," 6-7 May 1976, Birmingham, England, p. 5-8.

This report of practicum sessions for mobility officers utilizing vision reduction goggles is useful to mobility specialists planning in-service training or family program orientations. The goggles used produce combinations of acuities of CF 2', or CF 6' and 5° field restriction. Three types of activities are performed to demonstrate that learning to use low vision can take place in a variety of ways and situations. Group A used orange and white balls in activities to develop ability to track and locate moving objects. Differences in performance are reported as a result of differences in contrast of background, ball and clothing. Group B used negotiation of stairs as an example of normal but difficult situation. Repetition improved confidence, blind skills were important, and reaction to visual information was mixed. Group C traveled along a normal mobility route with and without aid of long cane. Subjects felt less strain after discussing methodical scanning. A group leader is necessary to teach and provide feedback in order that perceived visual stimuli have meaning. All groups reported improved performance during the repeat session.

(M.M.A.)

02476-06

A Guide for Training Clients to Utilize Low Vision Distance Aids for Mobility. BURTON, Robert S. Department of Blind Rehabilitation, Western Michigan University, Fall 1975, 34 pgs.

This guide concentrates on the need for, and the use of, monoculars and binoculars in low vision mobility. To this extent, fresnel prisms, eccentric fixation techniques, and the use of inverted Galilean telescopes are ignored or the effect minimized. However, given the large number of low vision distance aids, their myriad applications, and the diversity of training techniques, this is not a particularly severe criticism. The guides greatest value is in the discu-sion of techniques for holding the aids, the techniques and applications of scanning methods, the application of low vision aids to particular situations (eg. reading street signs, house numbers, supplementing verbal descriptions visually, and locating landmarks), and the limitations of low vision aids. A further point in favor of the paper is the author's discussion of aids as they interact with the individual. The aids are not treated as an entity within themselves, but rather as an extension of the individual user.

While the paper is well worth reading, the reader should beware of some dogmatic statements made by the author. Among those statements which should be taken with a grain of salt is the following: "The aid must be used in stationary positions only" (which may surprise some who drive with bioptic telescopes.) Such statements, while generally true, do not give credit to important "exceptions to the rule" and detract from an otherwise enjoyable and informative paper.

(G.G.)

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AAWB Low Vision Interest Group

The Low Vision Interest Group of the American Association of Workers for the Blind encourages the support of all interested persons in its activities to promote the development and stimulate the growth of low vision programs. Persons interested in joining can write AAWB National Office at 1511 K St., N.W., Washington, D.C. 20005, or the interest group secretary: M. Apple, 640 Prospect St., Westfield, N.J. 07090. AAWB membership dues are $20.00 or $5.00 for students.

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02476-01 Cory, D. and Prince, J. "A Report on the Incorporation of Low Vision Aids into the Orientation and Mobility Program of Low Vision Clients," Orientation and Mobility Program, Western Mich. University, 1975, 62 pages.

02476-06 Burton, R. "A Guide for Training Clients to Utilize Low Vision Distance Aids for Mobility," Department of Blind Rehabilitation, Western Mich. University, Fall 1975, 34 pages.

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LOW VISION ABSTRACTS

CUMULATIVE INDEX

FALL 1971 - FALL 1976

LOW VISION ABSTRACTS

CUMULATIVE INDEX

1971 - 1976

The Low Vision Abstracts Cumulative Index is a title-word index to issues of the Abstracts published from Fall 1971 through Fall 1976 (Vol. I, No. 1, No. 2, No. 3, No. 4, No. 5; Vol. II, No. 2, No. 3, No. 4).

The Low Vision Abstracts index utilizes a "natural language" indexing system based on the vocabulary originally used by the author. This approach allows the Low Vision Abstracts reader to easily identify and locate a paper for which he knows the title, or enables him to search keywords used by his colleagues which relate to his desired topic.

Cross References

Prepositions, articles, and plural forms of a word are eliminated from the indexing. For economy of search, certain other words of low retrieval value appear in the alphabetical listing only as a cross-reference "See" term (i.e. APPROACH - See "RESEARCH"). In order to help the reader identify synonyms or other keywords likely to contain related information, some "See also" cross-references are added (i.e. CHILD - See also "PERSON", "CLIENT", "STUDENT".)

Arrangement

The Low Vision Abstracts Cumulative Index is divided into two sections: DIRECTORY and KEYWORD INDEX. The DIRECTORY is a listing of all titles appearing in the Low Vision Abstracts based on the document's I.D. number. Each citation includes the I.D. number, full title, author, volume and page number, and abstract I.D. number when appropriate. The KEYWORD INDEX is in alphabetical order by the keyword. Each document (title) is listed once for each title keyword. Keywords are in bold print along the left-hand margins. Below the keyword is the title in which that keyword appears. The document I.D. number follows the title, i.e.:

AID
Training a client utilize low vision distance aid mobility 081
Use long cane client visual acuity 10/200 aid identification device 036

The document I.D. number refers back to the document I.D. number in the DIRECTORY where the reader can find the full bibliographic citation (author, title, source), i.e.:

GOGGLE
Night viewing goggle night-blind traveler 058

58	Night Viewing Goggles for Night-Blind Travelers	Coursey, T.	I(4) 12	01473-02

Feature Articles

Titles followed by an asterick (*) indicate the title is a feature article rather than an abstract.

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Compiled and Edited by:

Marianne May

DIRECTORY

DOC. #	TITLE	AUTHOR	VOL.	PAGE	ABSTRACT #
01	Low Vision Abstracts: An Introductory Statement	Eisenberg, R.A.	I(1)	1	
02	A General Survey of Pre-instructional Considerations for Teachers of Low-Vision Mobility Clients	Dailey, R.H.	I(1)	3	01171-01
03	Can a Colorblind Subject be Trained to Identify Colors by Discriminating among the Shades of Grey or Color which he Perceives?	Hagan, M.E.	I(1)	4	01171-02
04	Mobility and Concept Development for Low Vision Children	Hill, E.W.	I(1)	5	01171-03
05	Low Vision Evaluation	Turner, R.	I(1)	6	01171 04
06	The Partially Sighted Child	Kroleski, P.	I(1)	6	01171-05a
07	A Review of the History and Development of Low-Vision Aids and the Implications of this for the Future	Lynch, J.A.	I(1)	7	01171-05
08	Low Vision Training in Orientation & Mobility - Learning about the Individual	Specht, T.R.	I(1)	8	01171-06
09	The Adventitiously Blinded Adult Client	Turner, R.	I(1)	9	01171-07
10	Editorial	Kane, R.E.	I(1)	10	
11	Simulation: An Approach to Low Vision Research	Blasch, B.	I(2)	1	
12	Disaster or Not? Telescopics for Distance Vision in Mobility	Davidson, T.	I(2)	3	
13	The Low Vision Client in Relation to Orientation and Mobility	Floyd, J.M.	I(2)	9	01272-01
14	The Role of Experience in the Visually Handicapped's Visual Perceptual Ability	Hennessey, J.J. Weiss, J.A.	I(2)	10	01272-02
15	Low Vision Evaluation Pilot Study	Hill, E.W. Lewis, P.	I(2)	11	01272-03
16	Review of Recent Literature on Low Vision	Sifferman, E.	I(2)	13	01272-04
17	Object Identification Through Use of Low Vision	Specht, T.R.	I(2)	14	01272-05
18	Editorial	Apple, L.E.	I(2)	15	
19	Suggested Research Topics		I(2)	16	

DOC. #	TITLE	AUTHOR	VOL.	PAGE	ABSTRACT #
21	A Survey of Developments in a New Field: Orientation and Mobility for the Low Vision Person. Part I. Historical Perspective, Psychological Adjustment to Low Vision, Evaluation of Functional Vision	Davidson, T.	I(3)	1	
22	A Comparitive Study of the Effects of Sun Angle on the Distance Vision Outdoors of Low Vision Persons with Glaucoma and Macular Degeneration	Bennehoff, R.W.	I(3)	11	01372-01
23	The Effects of Vision Utilization on Distance Visual Efficiency	Dyer, C. Smith, A.	I(3)	12	01372-02
24	Medical Aspects of Eye Disease and Its Implications on Mobility	Hill, J.A.	I(3)	13	01372-03
25	Partial Sight	Adams, S. Del Frari, P. Hall, J. Pollack, S.	II(1)	9	02174-01
26	Survey of U.S. Agencies Serving the Blind and Low Vision Client	Adams, S. Del Frari, P. Hall, J. Pollack, S.	II(1)	10	02174-02
27	The Low Vision Evaluation Kit	Ehrnst, S.F.	II(1)	11	02174-03
28	The Evaluation of Auditory Object Perception in Low Vision Persons as it Relates to Orientation & Mobility	Hazard, W.G. Jr.	II(1)	12	02174-04
29	Suggested Research Topics		I(1)	11	
30	Evaluation of the Functional Behavior of Low Vision Students	Smith, J.D.	II(1)	13	02174-05
31	Functional Vision Evaluation: A Survey of Ophthalmologists in the Los Angeles Area	Unell, A.	II(1)	14	02174-06
32	Low Vision Simulation for Potential Orientation and Mobility Specialists	Zimmerman, L. Elliott, M.	II(1)	15	02174-07
33	Editorial	Apple, L.E.	II(1)	16	
34	Suggested Research Topic		II(1)	17	
35	The Cerebellum as a Subcortical Integrative Mechanism	Del Frari, P.	II(2)	1	
36	The Use of the Long Cane by Clients with Visual Acuity of 10/200 as an Aid or Identification Device	Blasch, B.	II(2)	8	02275-01

DOC. #	TITLE	AUTHOR	VOL.	PAGE	ABSTRACT #
37	A Survey of Public and Private Orientation & Mobility Programs for Retinitis Pigmentosa Clients	Hines, S.S.	II(2)	9	02275-02
38	An Evaluation of Auditory Object Perception in a Select Group of Totally Blind Individuals	Longo, T.J.	II(2)	10	02275-03
39	A Determination of the Area of Preferred Viewing	McLinden, D.J.	II(2)	11	02275-04
40	Color Perception and Low Vision	Miller, R.I.	II(2)	12	02275-05
41	Increasing Ability of Low Vision Clients to Judge Depth Through Training	Walker, S.	II(2)	13	02275-06
42	Editorial	Apple, L.E.	II(2)	17	
43	Low Vision Aids and Their Practical Application to Activities of Daily Living	Cory, P.	II(3)	1	
44	Orientation and Mobility and Low Vision Training Without Aids: Trends and Needs	Smith, A.	II(3)	11	
45	Development of a Scale Designed to Measure Functional Distance Vision Loss Using an Interview Technique	Haase, K.W. Bryant, E.E.	II(3)	23	02376-01
46	A Study to Evaluate the Effectiveness of an Intervention of Utilization of Residual Vision on the Independent Mobility of Persons with Low Vision	Mattingly, W.	II(3)	25	02376-02
47	Aspects Limiting Successful Use of Aids by Low Vision Individuals	Meyerson, N.	II(3)	26	02376-03
48	Visual Training and Mobility Training for the Person with Low Vision	Shibata, H.	II(3)	27	02376-04
49	Editorial	Apple, L.E.	II(3)	28	
50	Increasing Visual Efficiency Through Activity	Pickett, B.B.	I(3)	14	01372-04
51	Proposed Sample Items for a Form Assessing Visual Efficiency	Dechaine, G.	I(3)	15	01372-05
52	Mobility Vision Evaluation Form	Turner, R.	I(3)	19	01372-06
53	Sample Chart for Gathering Performance Data	Vigoroso, H.	I(3)	20	01372-07

DOC. #	TITLE	AUTHOR	VOL.	PAGE	ABSTRACT #
54	Editorial	Apple, L.E.	I(3)	21	
55	Suggested Research Topics		I(3)	23	
56	A Survey of Developments in a New Field: Orientation and Mobility for the Low Vision Person. Part II. Optical Aids Clinics and Optometry, Optical Aids for Mobility and Training in the Use of Optical Aids	Davidson, T.	I(4)	1	
57	Developing a Mobility Evaluation Procedure for Low Vision Clients	Baumstark, C. Carter, K. Coffin, C. Harriff, B.	I(4)	11	01473-01
58	Night Viewing Goggles for Night-Blind Travelers	Coursey, T.	I(4)	12	01473-02
59	A Proposed Syllabus Guide for the Instruction of Orientation and Mobility for the Low Vision Student	Moore, J.K.	I(4)	14	01473-03
60	Factors for Consideration by Orientation & Mobility Instructors when Developing a Distance Low Vision Training Program	Taylor, D.E. Major, M.S.	I(4)	15	01473-04
61	Summary - Low Vision Aids	Central Blind Rehabilitation Center, VAH, Hines, Illinois	I(4)	16	
62	Functional Vision Evaluation Distant Vision - Test Area - Test Area #1	Central Blind Rehabilitation Center, VAH, Ill.	I(4)	22	
63	Functional Vision Evaluation Distant - Moving Test Area #2	Central Blind Rehab. Center, VAH, Hines, Ill.	I(4)	23	
64	Functional Vision Evaluation - Test Area #5	Central Blind Rehab. Center,VAH	I(4)	24	
65	Editorial		I(4)	29	
66	Suggested Research Topics		I(4)	29	
67	A Survey of Developments in a New Field: Orientation and Mobility for the Low Vision Person. Part III. Perceptual Training, Orientation & Mobility and Conclusion	Davidson, T.	I(5)	1	
68	Subjective Field Examinations in Low Vision Evaluation	Apple, M.M.	I(5)	8	
69	A Study of Low Visual Acuity and Reduced Fields in a Residential Home for the Elderly	Dosch, T.G.	I(5)	14	01573-01

DOC. #	TITLE	AUTHOR	VOL.	PAGE	ABSTRACT #
70	Low Vision and Curb Detection	Kevorkian, G.A.	I(5)	15	01573-02
71	Editorial	Apple, L.E.	I(5)	16	
72	Suggested Research Topics		I(5)	17	
73	Visual Training Seminar on Low Vision	Adams, S. Del Frari, P. Hall, J. Pollack, S.	II(1)	1	
74	Some Psychophysical Considerations for Visual Training	Johnson, C.	II(4)	1	
75	The Artificial Reduction of Visual Cues as a Means of Preparing Training Programs for Low Vision Clients	Apple, L. Apple M.M. Blasch, D.	II(4)	4	
76	Evaluation of Visual Function	Hoover, R.E.	II(4)	6	
77	An Evaluation of a Research Information Dissemination and Translation Vehicle: Special Study Institutes on Utilization of Low Vision	Ozias, D.K.	II(4)	8	02476-03
78	Image Intensification: A Night Vision Aid for Nyctalopia	Miyaki, L.N.	II(4)	8	02476-02
79	A Report on the Incorporation of Low Vision Aids into the Orientation and Mobility Program of Low Vision Clients	Cory, D. Prince, J.	II(4)	8	02476-01
80	Low Vision Practicum	National Mobility Centre	II(4)	10	02476-05
81	A Guide for Training Clients to Utilize Low Vision Distance Aids for Mobility	Burton, R.S.	II(4)	10	02476-06
82	Eccentric Viewing Training	Holcomb, J.G. Goodrich, G.L.	II(4)	9	02476-04

ABILITY
- Role experience visually handicapped visual perceptual ability 014
- Increasing ability low vision client judge depth training 041

ABSTRACTS
- Low vision abstracts - introductory statement 01

ACTIVITY
- Low vision aid practical application activity daily living* 043
- Increasing visual efficiency activity 050

ACUITY
- Use long cane client visual acuity 10/200 aid identification device 036
- Low visual acuity reduced field residential home elderly 069

ADJUSTMENT
- Development new field - orientation mobility low vision person Pt. I. Historical perspective, psychological adjustment low vision, evaluation functional vision* 021

ADULT
- Adventitiously blind adult client 09

ADVENTITIOUSLY
- Adventitiously blind adult client 09

AGENCIES
- Survey U.S. agencies serving blind low vision client 026

AID
- Training client utilize low vision distance aid mobility 081
- Use long cane client visual acuity 10/200 aid identification device 036
- Low vision aid practical application activities daily living* 043
- Orientation mobility low vision training without aid trend need* 044
- Aspect limiting successful use aid low vision individual 047
- Survey development new field - orientation mobility low vision person. Pt. II. Optical aid clinic optometry, optical aid mobility training use optical aid* 056
- Summary - low vision aid 061
- Review history development low vision aid implication future 07
- Image intensification - night vision aid nyctalopia 078
- Report incorporation low vision aid orientation mobility program low vision client 079

ANGLE
- Comparitive effect sun angle distance vision outdoor low vision person glaucoma macular degeneration 022

APPLICATION
- Low vision aid practical application activities daily living* 043

APPROACH - See "RESEARCH"

AREA
- Functional vision evaluation survey study ophthalmologist Los Angeles area 031
- Determination area preferred viewing 039
- Functional vision evaluation distant vision - test area 062

ARTIFICIAL
- Artificial reduction visual cues means preparing training program low vision client* 075

ASPECT
- Medical aspect eye disease implication mobility 024
- Aspect limiting successful use aid low vision individual 047

ASSESSING
- Item form assessing visual efficiency 051

AUDITORY
- Evaluation auditory object perception low vision person relate orientation mobility 028
- Evaluation auditory object perception select group totally blind partially sighted individual 038

BEHAVIOR
- Evaluation functional behavior low vision student 030

BLIND
- Adventitiously blind adult client 09
- Survey U.S. agencies serving blind low vision client 026

Evaluation auditory object perception select group totally blind partially sighted individual 038

CANE
Use long cane client visual acuity 10/200 aid identification device 036

CEREBELLUM
Cerebellum subcortical integrative mechanism* 035

CHART - See "DATA"

CHILD - See also "PERSON" "CLIENT" "STUDENT"
Mobility concept development low vision child 04
Partially sighted child 06

CLIENT - See also "PERSON" "STUDENT" "CHILD"
General survey pre-instructional consideration teacher low vision mobility client 02
Low vision training orientation mobility learning individual vision mobility client 08
Adventitiously blind adult client 09
Low vision client relation orientation mobility 013
Survey U.S. agencies serving blind low vision client 026
Use long cane client visual acuity 10/200 aid identification device 036
Survey public private orientation mobility program retinitis pigmentosa client 037
Increasing ability low vision client judge depth training 041
Developing mobility evaluation procedure low vision client 057
Artificial reduction visual cues means preparing training program low vision client* 075
Report incorporation low vision aid orientation mobility program low vision client 079
Training client utilize low vision distance aid mobility 081

CLINIC
Survey development new field - orientation mobility low vision person. Pt. II. Optical aid clinic optometry, optical aid mobility training use optical aid* 056

COLOR
Colorblind subject trained identify color discrimination shade grey perceive 03
Color perception low vision 040

COLORBLIND
Colorblind subject trained identify color discrimination shade grey perceive 03

COMPARITIVE
Comparitive effect sun angle distance vision outdoor low vision person glaucoma macular degeneration 022

CONCEPT
Mobility concept development low vision child 04

CONCLUSION - See "SURVEY"

CONSIDERATION
General survey pre-instructional consideration teacher low vision mobility client 02
Factor consideration orientation mobility instructor developing distance low vision training program 060
Psychophysical consideration visual training* 074

CUES
Artificial reduction visual cues means preparing training program low vision client* 075

CURB - See "DETECTION"

DAILY - See "ACTIVITY"

DATA
Chart gathering performance data 053

DEGENERATION - See "MACULAR"

DEPTH
Increasing ability low vision client judge depth training 041

DESIGNED
Development scale designed measure functional distance vision loss using interview technique 045

DETECTION
Low vision curb detection 070

DETERMINATION
Determination area preferred viewing 039

DEVELOPING
Developing mobility evaluation procedure low vision client 057

  Factor consideration orientation mobility instructor developing distance low vision training program 060

DEVELOPMENT
  Mobility concept development low vision child 04
  Review history development low vision aid implication future 07
  Development scale designed measure functional distance vision loss using interview technique 045
  Survey development new field - orientation mobility low vision person. Pt. II. Optical aid clinic optometry, optical aid mobility training use optical aid* 056
  Survey development new field - orientation mobility low vision person. Pt. III. Perceptual training, orientation mobility conclusion* 067

DEVICE
  Use long cane client visual acuity 10/200 aid identification device 036

DISASTER - See "TELESCOPIC"

DISCRIMINATE
  Colorblind subject trained identify color discriminate shade grey perceive 03

DISEASE - See "MEDICAL"

DISSEMINATION - See "INFORMATION"

DISTANCE
  Disaster telescopic distance vision mobility* 012
  Comparitive effect sun angle distance vision outdoor low vision person glaucoma macular degeneration 022
  Effect vision utilization distance visual efficiency 023
  Development scale designed measure functional distance vision loss using interview technique 045
  Factor consideration orientation mobility instructor developing distance low vision training program 060
  Training client utilize low vision distance aid mobility 081

DISTANT
  Functional vision evaluation distant vision - test area 062
  Functional vision evaluation distant - moving 063

ECCENTRIC - See "TRAINING"

EDITORIAL
  Editorial 010
  Editorial 018
  Editorial 033
  Editorial 042
  Editorial 049
  Editorial 054
  Editorial 065
  Editorial 071

EFFECT
  Comparitive effect sun angle distance vision outdoor low vision person glaucoma macular degeneration 022
  Effect vision utilization distance visual efficiency 023

EFFECTIVENESS
  Evaluate effectiveness intervention utilization residual vision independent mobility person low vision 046

EFFICIENCY
  Effect vision utilization distance visual efficiency
  Increasing visual efficiency activity 050
  Item form assessing visual efficiency 051

ELDERLY
  Low visual acuity reduced field residential home elderly 069

EVALUATE
  Evaluate effectiveness intervention utilization residual vision independent mobility person low vision 046

EVALUATION
  Low vision evaluation 05
  Low vision evaluation 015
  Development new field - orientation mobility low vision person Pt. I. Historical perspective, psychological adjustment low vision, evaluation functional vision* 021
  Low vision evaluation kit 027
  Evaluation auditory object perception low vision person relate orientation mobility 028
  Evaluation functional behavior low vision student 030
  Functional vision evaluation survey study ophthalmologist Los Angeles area 031
  Evaluation auditory object

  perception select group totally blind partially sighted individual 038
  Mobility vision evaluation form 052
  Developing mobility evaluation procedure low vision client 057
  Functional vision evaluation distant vision - test area 062
  Functional vision evaluation distant - moving 063
  Functional vision evaluation 064
  Subjective field examination low vision evaluation* 068
  Evaluation visual function* 076
  Evaluation research information dissemination translation vehicle - special study institute utilization low vision 077

EXAMINATION - See "EVALUATION"

EXPERIENCE - See "PERCEPTUAL"

EYE
  Medical aspect eye disease implication mobility 024

FACTOR - See "PROGRAM"

FIELD
  Survey development new field - orientation mobility low vision person. Pt. II. Optical aid clinic optometry, optical aid mobility training use optical aid* 056
  Survey development new field - orientation mobility low vision person. Pt. III. Perceptual training, orientation mobility conclusion* 067
  Subjective field examination low vision evaluation* 068
  Low visual acuity reduced field residential home elderly 069

FORM
  Item form assessing visual efficiency 051
  Mobility vision evaluation form 052

FUNCTION - See "VISUAL"

FUNCTIONAL
  Development new field - orientation mobility low vision person Pt. I. Historical perspective, psychological adjustment low vision, evaluation functional vision* 021
  Evaluation functional behavior low vision student 030
  Functional vision evaluation survey study ophthalmologist Los Angeles area 031
  Development scale designed measure functional distance vision loss using interview technique 045
  Functional vision evaluation distant vision - test area 062
  Functional vision evaluation distant - moving 063
  Functional vision evaluation 064

FUTURE - See "IMPLICATION"

GATHERING - See "DATA"

GENERAL - See "SURVEY"

GLAUCOMA
  Comparitive effect sun angle distance vision outdoor low vision person glaucoma macular degeneration 022

GOGGLE
  Night viewing goggle night-blind traveler 058

GREY - See "COLOR"

GROUP
  Evaluation auditory object perception select group totally blind partially sighted individual 038

GUIDE - See "INSTRUCTION"

HANDICAPPED
  Role experience visually handicapped visual perceptual ability 014

HISTORICAL
  Survey development new field - orientation mobility low vision person Pt. I. Historical perspective, psychological adjustment low vision, evaluation functional vision* 021

HISTORY
  Review history development low vision aid implication future 07

HOME - See "RESIDENTIAL"

IDENTIFICATION
  Object identification use low vision 017
  Use long cane client visual acuity 10/200 aid identification device 036

IDENTIFY
  Colorblind subject trained identify color discriminating shade grey perceive 03

IMAGE
  Image intensification - night vision aid nyctalopia 078

IMPLICATION
  Review history development low vision aid implication future 07
  Medical aspect eye disease implication mobility 024

INCORPORATION - See "PROGRAM"

INCREASING
  Increasing ability low vision client judge depth training 041
  Increasing visual efficiency activity 050

INDEPENDENT - See "MOBILITY"

INDIVIDUAL - See "PERSON"
  Low vision training orientation mobility learning individual vision mobility client 08

INFORMATION
  Evaluation research information dissemination translation vehicle - special study institute utilization low vision 077

INSTITUTE - See "INFORMATION"

INSTRUCTION
  Syllabus guide instruction orientation mobility low vision student 059

INSTRUCTOR - See "MOBILITY"

INTEGRATIVE - See "CEREBELLUM"

INTENSIFICATION
  Image intensification - night vision aid nyctalopia 078

INTERVENTION - See "UTILIZATION"

INTERVIEW
  Development scale designed measure functional distance vision loss using interview technique 045

ITEM - See "FORM"

JUDGE
  Increasing ability low vision client judge depth training 041

KIT - See "EVALUATION"

LEARNING
  Low vision training orientation mobility learning individual vision mobility client 08

LIMITING
  Aspect limiting successful use aid low vision individual 047

LITERATURE
  Review literature low vision 016

LIVING - See "ACTIVITY"

LONG - See "CANE"

LOSS
  Development scale designed measure functional distance vision loss using interview technique 045

LOW - See "VISION"

MACULAR
  Comparitive effect sun angle distance vision outdoor low vision person glaucoma macular degeneration 022

MEANS
  Artificial reduction visual cues means preparing training program low vision client* 075

MEASURE
  Development scale designed measure functional distance vision loss using interview technique 045

MECHANISM - See "CEREBELLUM"

MEDICAL
  Medical aspect eye disease implication mobility 024

MOBILITY
  General survey pre-instructional consideration teacher low vision mobility client 02
  Mobility concept development low vision child 04
  Low vision training orientation mobility learning individual vision mobility client 08
  Disaster telescopic distance vision mobility* 012
  Low vision client relation orientation mobility 013

- Medical aspect eye disease implication mobility 024
- Evaluation auditory object perception low vision person relate orientation mobility 028
- Low vision simulation potential orientation mobility specialist* 032
- Survey public private orientation mobility program retinitis pigmentosa client 037
- Orientation mobility low vision training without aid trend need* 044
- Evaluate effectiveness intervention utilization residual vision independent mobility person low vision 046
- Visual training mobility training person low vision 048
- Mobility vision evaluation form 052
- Survey development new field - orientation mobility low vision person. Pt. II. Optical aid clinic optometry, optical aid mobility training use optical aid* 056
- Developing mobility evaluation procedure low vision client 057
- Syllabus guide instruction orientation mobility low vision student 059
- Factor consideration orientation mobility instructor developing distance low vision training program 060
- Survey development new field - orientation mobility low vision person. Pt. III. Perceptual training, orientation mobility conclusion* 067
- Report incorporation low vision aid orientation mobility program low vision client 079
- Training client utilize low vision distance aid mobility 081

MOVING - See "EVALUATION"

NEED - See "TREND"

NEW - See "SURVEY"

NIGHT
- Night viewing goggle night-blind traveler 058
- Image intensification - night vision aid nyctalopia 078

NIGHT-BLIND - See "NIGHT"

NYCTALOPIA - See "NIGHT"

OBJECT
- Object identification use low vision 017
- Evaluation auditory object perception low vision person relate orientation mobility 028
- Evaluation auditory object perception select group totally blind partially sighted individual 038

OPHTHALMOLOGIST
- Functional vision evaluation survey study ophthalmologist Los Angeles area 031

OPTICAL
- Survey development new field - orientation mobility low vision person. Pt. II. Optical aid clinic optometry, optical aid mobility training use optical aid* 056

OPTOMETRY
- Survey development new field - orientation mobility low vision person. Pt. II. Optical aid clinic optometry, optical aid mobility training use optical aid* 056

ORIENTATION - See "MOBILITY"

OUTDOOR
- Comparitive effect sun angle distance vision outdoor low vision person glaucoma macular degeneration 022

PARTIAL
- Partial sight 025

PARTIALLY
- Partially sighted child 06
- Evaluation auditory object perception select group totally blind partially sighted individual 038

PERCEIVE
- Colorblind subject trained identify color discrimination shade grey perceive 03

PERCEPTION
- Evaluation auditory object perception low vision person relate orientation mobility 028
- Evaluation auditory object perception select group totally blind partially sighted individual 038

Color perception low vision 040

PERCEPTUAL
- Role experience visually handicapped visual perceptual ability 014
- Survey development new field - orientation mobility low vision person. Pt. III. Perceptual training, orientation mobility conclusion* 067

PERFORMANCE
- Chart gathering performance data 053

PERSON - See also "CLIENT" "STUDENT" "CHILD"
- Colorblind subject trained identify color discriminating shade grey perceive 03
- Comparitive effect sun angle distance vision outdoor low vision person glaucoma macular degeneration 022
- Evaluation auditory object perception low vision person relate orientation mobility 028
- Evaluation auditory object perception select group totally blind partially sighted individual 038
- Evaluate effectiveness intervention utilization residual vision independent mobility person low vision 046
- Aspect limiting successful use aid low vision individual 047
- Visual training mobility training person low vision 048
- Survey development new field - orientation mobility low vision person. Pt. II. Optical aid clinic optometry, optical aid mobility training use optical aid* 056
- Night viewing goggle night-blind traveler 058
- Survey development new field - orientation mobility low vision person. Pt. III. Perceptual training, orientation mobility conclusion* 067

PERSPECTIVE
- Survey development new field - orientation mobility low vision person Pt. I. Historical perspective, psychological adjustment low vision, evaluation functional vision* 021

PIGMENTOSA - See "RETINITIS"

POTENTIAL
- Low vision simulation potential orientation mobility specialist* 032

PRACTICAL
- Low vision aid practical application activities daily living* 043

PRACTICUM
- Low vision practicum 080

PRE-INSTRUCTIONAL
- General survey pre-instructional consideration teacher low vision mobility client 02

PREFERRED
- Determination area preferred viewing 039

PREPARING - See "PROGRAM"

PRIVATE
- Survey public private orientation mobility program retinitis pigmentosa client 037

PROCEDURE - See "EVALUATION"

PROGRAM
- Survey public private orientation mobility program retinitis pigmentosa client 037
- Factor consideration orientation mobility instructor developing distance low vision training program 060
- Artificial reduction visual cues means preparing training program low vision client* 075
- Report incorporation low vision aid orientation mobility program low vision client 079

PSYCHOLOGICAL
- Development new field - orientation mobility low vision person Pt. I. Historical perspective, psychological adjustment low vision, evaluation functional vision* 021

PSYCHOPHYSICAL
- Psychophysical consideration visual training* 074

PUBLIC
- Survey public private orientation mobility program retinitis pigmentosa client 037

REDUCED
- Low visual acuity reduced field residential home elderly 069

REDUCTION
- Artificial reduction visual cues means preparing training program low vision client* 075

RELATE
- Evaluation auditory object perception low vision person relate orientation mobility 028

RELATION
- Low vision client relation orientation mobility 013

REPORT
- Report incorporation low vision aid orientation mobility program low vision client 079

RESEARCH
- Approach low vision research* 011
- Research topic 019
- Research topic 029
- Research topic 034
- Research topic 055
- Research topic 066
- Research topic 072
- Evaluation research information dissemination translation vehicle-special study institute utilization low vision 077

RESIDENTIAL
- Low visual acuity reduced field residential home elderly 069

RESIDUAL
- Evaluate effectiveness intervention utilization residual vision independent mobility person low vision 046

RETINITIS
- Survey public private orientation mobility program retinitis pigmentosa client 037

REVIEW
- Review literature low vision 016
- Review history development low vision aid implication future 07

ROLE
- Role experience visually handicapped visual perceptual ability 014

SCALE - See "MEASURE"

SELECT
- Evaluation auditory object perception select group totally blind partially sighted individual 038

SEMINAR - See "TRAINING"

SERVING - See "AGENCIES"

SHADE - See "COLOR"

SIGHT
- Partial sight 025

SIGHTED
- Evaluation auditory object perception select group totally blind partially sighted individual 038
- Partially sighted child 06

SIMULATION
- Low vision simulation potential orientation mobility specialist* 032

SPECIAL
- Evaluation research information dissemination translation vehicle - special study institute utilization low vision 077

SPECIALIST - See "MOBILITY"

STUDENT - See also "CLIENT" "PERSON" "CHILD"
- Evaluation functional behavior low vision student 030
- Syllabus guide instruction orientation mobility low vision student 059

STUDY
- Functional vision evaluation survey study ophthalmologist Los Angeles area 031
- Evaluation research information dissemination translation vehicle-special study institute utilization low vision 077

SUBCORTICAL - See "CEREBELLUM"

SUBJECT - See "PERSON"

SUBJECTIVE
- Subjective field examination low vision evaluation* 068

SUCCESSFUL
- Aspect limiting successful use aid low vision individual 047

SUMMARY
- Summary - low vision aid 061

SUN
- Comparitive effect sun angle distance vision outdoor low vision person glaucoma macular degeneration 022

SURVEY
- General survey pre-instructional consideration teacher low vision mobility client 02
- Survey U.S. agencies serving blind low vision client 026
- Functional vision evaluation survey study ophthalmologist Los Angeles area 031
- Survey public private orientation mobility program retinitis pigmentosa client 037
- Development new field - orientation mobility low vision person Pt. I. Historical perspective, psychological adjustment low vision, evaluation functional vision* 021
- Survey development new field - orientation mobility low vision person. Pt. II. Optical aid clinic optometry, optical aid mobility training use optical aid* 056
- Survey development new field - orientation mobility low vision person. Pt. III. Perceptual training, orientation mobility conclusion* 067

SYLLABUS
- Syllabus guide instruction orientation mobility low vision student 059

TEACHER
- General survey pre-instructional consideration teacher low vision mobility client 02

TECHNIQUE
- Development scale designed measure functional distance vision loss using interview technique 045

TELESCOPIC - See also "AID"
- Disaster telescopic distance vision mobility* 012

TEST - See "EVALUATION"

TOPIC - See "RESEARCH"

TOTALLY
- Evaluation auditory object perception select group totally blind partially sighted individual 038

TRAINED
- Colorblind subject trained identify color discriminating shade grey perceive 03

TRAINING
- Increasing ability low vision client judge depth training 041
- Orientation mobility low vision training without aid trend need* 044
- Visual training mobility training person low vision 048
- Survey development new field - orientation mobility low vision person. Pt. II. Optical aid clinic optometry, optical aid mobility training use optical aid* 056
- Factor consideration orientation mobility instructor developing distance low vision training program 060
- Visual training seminar low vision* 073
- Psychophysical consideration visual training* 074
- Artificial reduction visual cues means preparing training program low vision client* 075
- Low vision training orientation mobility learning individual vision mobility client 08
- Training client utilize low vision distance aid mobility 081
- Eccentric viewing training 082

TRANSLATION - See "INFORMATION"

TRAVELER - See "PERSON"

TREND
- Orientation mobility low vision training without aid trend need* 044

USE
- Object identification use low vision 017
- Use long cane client visual acuity 10/200 aid identification device 036
- Aspect limiting successful use aid low vision individual 047
- Survey development new field - orientation mobility low vision person. Pt. II. Optical aid clinic optometry, optical aid mobility training use optical aid* 056

UTILIZATION
- Effect vision utilization distance visual efficiency 023
- Evaluate effectiveness intervention utilization residual vision independent mobility person low vision 046
- Evaluation research information dissemination translation vehicle - special study institute utilization low vision 077

UTILIZE
- Training client utilize low vision distance aid mobility 081

VEHICLE - See "TRANSLATION"

VIEWING
- Determination area preferred viewing 039
- Night viewing goggle night-blind traveler 058
- Eccentric viewing training 082

VISION
- Low vision abstracts - introductory statement 01
- General survey pre-instructional consideration teacher low vision mobility client 02
- Mobility concept development low vision child 04
- Low vision evaluation 05
- Review history development low vision aid implication future 07
- Low vision training orientation mobility learning individual vision mobility client 08
- Approach low vision research* 011
- Disaster telescopic distance vision mobility* 012
- Low vision client relation orientation mobility 013
- Low vision evaluation 015
- Review literature low vision 016
- Object identification use low vision 017
- Development new field - orientation mobility low vision person Pt. I. Historical perspective, psychological adjustment low vision, evaluation functional vision* 021
- Comparitive effect sun angle distance vision outdoor low vision person glaucoma macular degeneration 022
- Effect vision utilization distance visual efficiency 023
- Survey U.S. agencies serving blind low vision client 026
- Low vision evaluation kit 027
- Evaluation auditory object perception low vision person relate orientation mobility 028
- Evaluation functional behavior low vision student 030
- Functional vision evaluation survey study ophthalmologist Los Angeles area 031
- Low vision simulation potential orientation mobility specialist* 032
- Color perception low vision 040
- Increasing ability low vision client judge depth training 041
- Low vision aid practical application activities daily living* 043
- Orientation mobility low vision training without aid trend need* 044
- Development scale designed measure functional distance vision loss using interview technique 045
- Evaluate effectiveness intervention utilization residual vision independent mobility person low vision 046
- Aspect limiting successful use aid low vision individual 047
- Visual training mobility training person low vision 048
- Mobility vision evaluation form 052
- Survey development new field - orientation mobility low vision person. Pt. II. Optical aid clinic optometry, optical aid mobility training use optical aid* 056
- Developing mobility evaluation procedure low vision client 057
- Syllabus guide instruction orientation mobility low vision student 059
- Factor consideration orientation mobility instructor developing distance low vision training program 060
- Summary - low vision aid 061
- Functional vision evaluation distant vision - test area 062
- Functional vision evaluation distant - moving 063
- Functional vision evaluation 064
- Survey development new field - orientation mobility low vision person. Pt. III. Perceptual training, orientation mobility conclusion* 067
- Subjective field examination low vision evaluation* 068
- Low vision curb detection 070

Visual training seminar low vision* 073
Artificial reduction visual cues means preparing training program low vision client* 075
Evaluation research information dissemination translation vehicle - special study institute utilization low vision 077
Image intensification - night vision aid nyctalopia 078
Report incorporation low vision aid orientation mobility program low vision client 079
Low vision practicum 080
Training client utilize low vision distance aid mobility 081

VISUAL
Role experience visually handicapped visual perceptual ability 014
Effect vision utilization distance visual efficiency 023
Use long cane client visual acuity 10/200 aid identification device 036
Visual training mobility training person low vision 048
Increasing visual efficiency activity 050
Item form assessing visual efficiency 051
Low visual acuity reduced field residential home elderly 069
Visual training seminar low vision* 073
Artificial reduction visual cues means preparing training program low vision client* 075
Evaluation visual function* 076

VISUALLY
Role experience visually handicapped visual perceptual ability 014

WITHOUT - See "AID"

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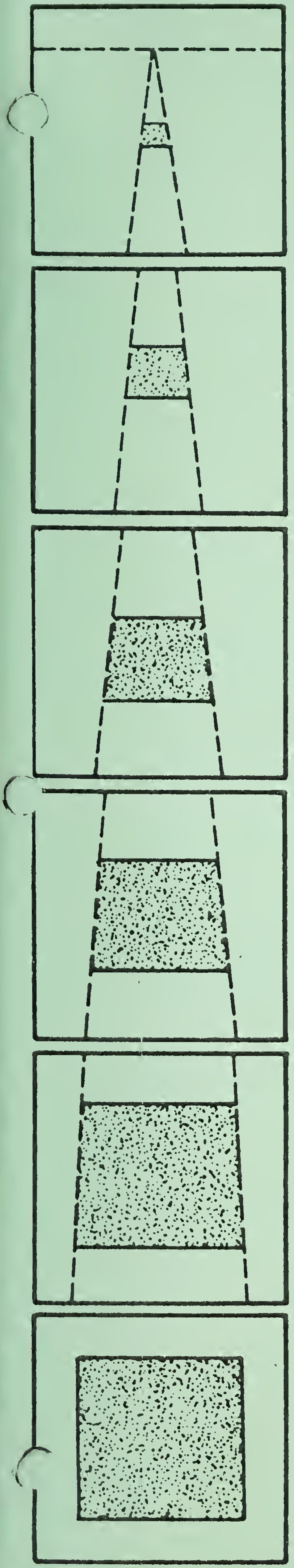

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LOW VISION ABSTRACTS promotes the information needs and skill growth within the areas of teaching the use of residual vision for low vision children or adults. When it began in 1971, the ABSTRACTS emphasized distance vision which drew the attention of orientation and mobility specialists. In 1976 the scope was broadened to include all areas of learning and phenomena which are related to low vision, both near and distance. This approach is designed to be of more use to the classroom teacher, the rehabilitation teacher and the rehabilitation counselor.

LOW VISION ABSTRACTS contains feature articles which deal with either research or practice, abstracts from the literature in the field, bibliographies and suggested research topics. The ABSTRACTS does not deal with optical aids as such, or pathology as such, since both these areas have their own well-developed literature.

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LOW VISION ABSTRACTS

Spring 1977 Vol. III No. 1

CONTENTS

FEATURE ARTICLES

Visual Training Without Aids
William M. Ludlam, O.D. 1

Utilization of Visual Information Functional Signs
Deborah J. Oppel
Denise H. Pascuzzi
Rosalie Pikovsky
John A. Williams
Mary W. Moore, Ph.D. 4

Survey of Low Vision Clinics in the United States Regarding the Training and Employment of the Low Vision Specialist
Terry Parker 13

GUIDE TO FINANCIAL SUPPORT FOR LOW VISION PROGRAMS
Marianne May 19

EDITORIAL -- LOW VISION CITIZENS
Loyal E. Apple 21

ABSTRACTS

Practice Effects upon Performance with Low Vision Aids 22

Low Vision Training for Mobility Purposes 22

A New Concept in Low Vision Optometric Care at the Western Pennsylvania School for Blind Children 23

The Use of Residual Vision in Orientation and Mobility 24

A Comparison Study Between Black-Red, Black-Yellow Color Coding for Head Level Obstacle Detection 24

The Empathic Model - Getting Inside the Older Skin 24

CURRENT BIBLIOGRAPHY
Marianne May
Gregory Goodrich 26

LVA COPY REFERENCE SERVICE 29

COVER:

The illustration is of successive transformation of the image of a square of pavement while a person is walking along a street. It was sketched from a figure given by J. J. Gibson in The Perception of the Visual World. "A transformation is a regular and lawful event which leaves certain properties of the pattern invariant.

The motif of Low Vision Abstracts is TRANSFORMATION of mobility, rehabilitation, and classroom teaching through an increased understanding of the visual environment of the low vision person.

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VISUAL TRAINING WITHOUT AIDS

By William M. Ludlam, O.D.
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Introduction

In stable low vision, the preferred course of treatment is the use of optical aids to enhance what residual central acuity remains. Often several aids designed for specific purposes are utilized by low vision patients. Following the prescription and fitting of the device(s), training in their use, advantages and limitations is undertaken.

There are a number of ocular conditions causing severe visual impairment, however, in which optical aids are of no benefit or are of such minimal benefit that their use is not indicated. There are several general types of problems which fall into this category. These follow:

1. Constrictions of the peripheral field.
    a. Approximately concentric, such as in retinitis pigmentosa or advanced glaucoma.
    b. Hemianoptic or sector defects caused by such conditions as brain tumors or blood clots, e.g. tumor of the chiasm causing bi-temporal hemianopsia or quandrantanopsia, and bilateral retinal detachments.
2. Where disseminated or dense opacification does not permit magnification to improve acuity, e.g. multiple vitreous hemorrhages or vitreous floaters severely eccentric pupil, dense corneal scarring or dense cataract which cannot be removed for health reasons such as diabetes or hypertension.
3. Extreme photophobia which is aggravated or caused by magnification which improves acuity, e.g. rod achromatopsia.
4. Large central scotomas (limited blind areas greater than 10°) e.g. macular hemorrhage.

In these types of visual problems often visual training of residual visual skills is required to enhance them to a level where the low vision patient can make use of these skills to become or remain ambulatory and mobile.

General Principles of Training

The eyes are the dominant telereceptor system of the body. They serve to locate objects in visual space which have potential importance to the observer. This function is often performed by the peripheral retina. Once located, the images of these objects are moved to the central (foveal-macular retina), the area with high resolution potential for detailed inspection (fixation reflex). It is precisely this function (high foveal resolution) which is generally absent or deficient in the low vision patient. Resolving ability is often necessary to identify the object and to give such information at a distance as: size, shape, color, mass, distance away and for human and animal objects mood, intention, recognition and other subtle facial expressions.

If a visually impaired individual is to function in a complex visual environment, he must be helped to develop new methods or to enhance his present techniques to give him the information listed above concerning his surrounds.

A basic decision has to be made by the therapist as to whether to "write off" vision, if the eyes and visual system are so severely damaged or if the deterioration in vision is progressive so as to possibly lead to total blindness and to elevate audition, taction and proprioception as primary information gatherers, i.e. to treat that subnormal vision patient as a blind person.

If the decision is to use vision together with taction, proprioception, and audition, the question as to whether vision is good enough to "lead" or to accompany or assist the other senses must be decided.

1. If the decision that vision is to lead is made and no improvement by optical aids can be effected, then every effort to bring about improved operation in visual function should be made in the course of visual training. Such general areas as the following should be investigated.

   a. If a severe limitation of visual field exists, the use of eye, head and body movements to aid in visual scanning to compensate for the reduction in functioning visual field should be stressed. These movements also aid in estimation of depth by "motion parallax" which is especially important if the patient is essentially monocular. Here the patient is taught to observe that objects which are nearer than the object being fixated, tend to show an "against" movement with respect to that viewed object. The nearer the object to the observer, i.e. the greater the displacement of the test object from the fixated reference object, the faster the "against" movement. Objects located further than the fixated reference object are observed to move in the same direction as the movement of the head, a so-called "with" movement, while the fixated reference remains stationary. Again, the greater the displacement of the test object behind the reference object, the faster the "with" movement.

   b. If a gross central scotoma is present which leaves a large area of non-functioning central visual field, imaging an object on this retinal area will produce very poor resolution. If peripheral retina is normal or at least partially functional, teaching the patient eccentric fixation, that is to turn the eyes the least amount to the side so that the optical image of the spatial object of interest falls within the functioning visual field. Thus, the patient must be taught a mis-match between oculocentric direction and egocentric localization in the interest of better information gathering. This is usually found to be extremely difficult for those who have developed a low vision condition after many years of normal visual function (adventitious low vision.) However, when this skill is mastered, often remarkable improvements in visual resolution do occur.

   c. When the patient has large rhythmic pendular ocular nystagmoid movements such as is generally observed in albinism and other congenital conditions in which developmental macular impairments occur, achieving a reduction in the frequency and amplitude of these nystagmoid movements often results in marked improvement in acuity. The patient has often learned himself to turn his head to the side to place his better eye at the end of the range of lateral gaze, to mechanically damp down the frequency and amplitude of nystagmoid oscillations. If he has not learned this "trick" himself, teaching him to do this will often vastly improve the stability of central fixation and with it central visual acuity. In other cases, ocular nystagmus is caused by vestibular involvement with no direct ocular etiology at all. The reduction in visual acuity, however, is just as severe.

   d. Optimizing level of illumination. Experimenting with different combinations of focal and surround illumination to produce the best figure - ground contrast ratios. For normally sighted individuals, the optimum ratio for such tasks as desk work and T.V. viewing for both comfort factors and figure ground considerations runs from 2 to 1 to as high as 10 to 1 (light entering the eye from figure vs. ground). However, in the low vision patient, the usual rod/cone ratio of 120/7 may be radically altered and the action of the pupil and its position and shape in the optical system due to traumatic or post-surgical factors may vary considerably from the norm. Opacities depending on their location may also change the efficiency of illumination at various levels.

Thus, it is frequently found that unexpected relationships between illumination levels and visual performance exist, such that best visual acuity for distance visual tasks may occur for moderate illumination with no central-peripheral variation and best near performance is achieved for low central illumination with dark periphery. Of course, illumination levels may be manipulated only as certain surrounds such as the patient's indoor living and work areas and not in many of his other environments. However, knowledge of the optimum for any given patient is important and useful for the application of tinted lenses, visors, side shields and other light control devices.

2. If either vision after training cannot be elevated to supremacy among a patient's perceptual modes, or the decision to relegate it to auxiliary status was made initially, with no attempt at training, the following approaches are helpful in attaining this end:

   a. Visual-proprioceptive-tactual integration often familiarly known as eye-hand and eye-foot coordination. This training approach can be used to elevate vision to supremacy or merely to integrate or coordinate visual, tactual and proprioceptive functions so that vision may be utilized for body orientation with respect to a visual stimulus and for developing a basic gross visual space metric in the near body surround. The length of the arms may be extended, e.g. with stick or cane so that the near body surround can be enlarged. Initially, objects in the surround are touched and the patient encouraged to orient body and eyes toward them and to match the visual impression with the proprioceptive and tactually established distance. Then visual stimuli are presented in different locations and at different distances from the patient and he is next encouraged to look at, reach for and grasp the objects one after the other. In dealing with young children, it is helpful in maintaining motivation to reward at least some of the correct responses with raisins, cookies, M&M's, or like "currency".

   b. Visual-Auditory integration. This skill can be trained with either objects that emit sounds continuously or intermittently or emit sounds only as a direct feedback after a correct visual localization response has been achieved. Thus, "squeaky" toys can be held by the therapist in different locations and at different distances and initially after continuous rapid squeaking used to "home in" the patient on the visually fixated object. Once fast success is achieved in this undertaking by faster localization, fewer and fewer squeaks are used. To use sound as feedback, a photocell "beeper" can be mounted on a slowly rotating vertical disc board and a collimated flashlight held by the patient is aimed at the photocell rotating on the disc board. When the light impinges on the photocell, the beeper immediately signals the patient that he has made a correct response and auditory feedback thus is used to enhance visual fixation. The recent report of ultrasound aids for teaching blind infants to localize objects in space and to develop a "space metric" is simply a more sophisticated advance to this approach.

In conclusion, the preferred route in rehabilitating low vision patients is to optimize visual acuity with optical aids and to employ the approaches described above to maximize the efficient use of vision and visual perception with the aid. In the minority of persons suffering from low vision who cannot be helped with low vision aids, these techniques may be applied for maximum utilization of their residual vision.

UTILIZATION OF VISUAL INFORMATION
FUNCTIONAL SIGNS

By Deborah J. Oppel*
Denise H. Pascuzzi*
Rosalie Pikovsky*
John A. Williams*
Mary W. Moore**, Ph.D.

Forward

The utilization of low vision for the interpretation of environmental clues in travel should be developed. In addition to the natural environmental clues provided by nature, the blind child should be trained to identify the many signs and man-made environmental clues which he may encounter. The following curriculum has been developed from a component analysis of the terminal task: "Read Functional Sign." The lessons have been divided into Levels which are arranged sequentially, enabling the child to move smoothly from Level I through Level VII to the accomplishment of the terminal task.

Each level contains several Lessons, also arranged sequentially in accordance with the postulated component analysis. For each lesson, an objective is stated and suggested activities are presented. It is understood that not all children will begin at Level I, and that not all children will reach Level VII. The teacher should establish the entry level of the child by testing the objectives of each lesson from Level I and instruction should begin at the lesson in which the child fails to meet the objectives.

A Partial List of Functional Words:

Stop
Wait
Walk
Don't Walk
Go
Yield
Crosswalk
Men
Gentlemen
Women
Ladies
Boys
Girls
In
Out
Exit
Restrooms
Entrance
Telephone
Danger
Keep Away
Men Working
No Trespassing
Do Not Disturb
Hospital
One Way
Dead End
RR Crossing
Deer Crossing

Bike Lane
Bus Stop
Cab Stand
Quiet
No Running
Slippery When Wet
No Smoking
Pay Here
Information
Cashier
Tickets
Wet Paint
Do Not Enter
Push
Pull
Private
This Way
Open
Close
Out to Lunch
Receptionist
For Rent
Sold
For Sale
Help Wanted

(Various picture signs)

---

*Division of Specialized Professional Development, Program in Special Education, Education of the Visually Handicapped, University of Pittsburgh

**Advisor

To the Teacher:

1. For all drawings and shapes drawn by the teacher, use a black magic marker, medium tip, on a medium weight, white, non-glossy paper unless otherwise specified.

2. The room should be well lighted with the child's desk of appropriate size for the child. There should not be any undue distractions such as other children playing or listening to records in the same room, unless otherwise specified.

3. With objects, the child should be encouraged to look at the objects rather than handle them. At the very earliest stages of an exercise, the child should be allowed to handle the objects while looking at them, but the handling should diminish to the point of stopping as the lesson goes on.

4. All pictures used should be simple with true to life colors and as little extra in the picture as possible; just the subject of the picture itself is best.

5. Pick objects that are relevant to the final objective, according to those signs the child is likely to encounter. (See List)

Level I

The low vision child who is functioning as a totally blind child must become aware of the difference between light and no-light in the environment.

Lesson 1:

Objective: Child will indicate awareness of light and position of light source relative to his body, and will follow path of moving light (track).

Activities:

Light Perception: Play light games. Can the child determine when the room lights are on or off and when the room is light or dark?

Light Projection: Flash a penlight about 6 inches from the child's eyes. Does he respond to the light? Does he reach for it? The light should also be flashed above, below, to the right, and to the left of the child's face to check for peripheral vision. Flash a flashlight on an empty wall. Can the child point to it?

Visual Light Tracking: Move the penlight slowly back and forth and up and down in front of the child's eyes. Does he respond to the light moving his eyes or head to follow the light?

Level II

The child must learn to perceive objects in the environment as being visually meaningful.

Lesson 2:

Objective: Child will fixate and follow spotlighted object with eyes.

Activities:

Shine flashlight on object while moving the object slowly back and forth in front of the child's face. Does he respond by moving his eyes or head to follow the spotlighted object? Objects that may be used include balloons, candy on a string, brightly colored plastic ring, etc.

Lesson 3:

Objective: Child will discriminate spotlighted, stationary object from background.

Activities:

Place black objects (i.e., black cylinders, discs, any simple objects) on a piece of white poster board. Using a penlight, shine it on one of the objects. Can the child locate the spotlighted object visually and hand it to the instructor? Do the same as above but reverse the colors - use white objects on black poster board. Does this make a difference? Try other color variations and contrasts. Does the child show any color preference?

Lesson 4:

Objective: Child will follow (track) moving object visually.

Activities:

Use a black object rolled or pushed on a white background or a white object on a black background (i.e., ball, toy car, wind-up toy). Can the child follow the object? Can he visually determine if the object is still or moving? Vary the distance at which the object is presented. Vary the colors of the objects and contrasting backgrounds.

Using a brightly colored object (ball on a string, balloon, wrapped candy on a string), swing it back and forth in front of the child's face. Does he track the object from right to left or left to right? Can he identify it as still or moving? Vary the colors and sizes of the objects and the distance at which they are presented.

Lesson 5:

Objective: Child will discriminate stationary object from background.

Activities:

Use black object on white background or white object on black background (i.e., cylinder, ball, block). Can the child locate the object visually and attend to it? Does he reach for it? Move to less contrasting colored objects and vary the size and distance at which it is presented.

Level III

The child must attend to critical features in order to classify basic shapes into meaningful concepts.

Lesson 6:

Objective: Child will discriminate solid geometric shapes.

Activities:

Using a contrasting background (i.e., white on black, black on white), present three geometric shapes, two alike and one different (i.e., two circles, one square.) Can the child visually discriminate which one of the three shapes is different from the other two by pointing to the different one (you may wish to say "which one is not the same" rather than saying "different".) Use the four basic shapes in various combinations. Vary the colors, contrasting backgrounds and sizes of the 3D shapes.

Lesson 7:

Objective: Child will recognize solid geometric shapes.

Activities:

Show the child one 3D shape (i.e., ball.) Then show him three more differing 3D shapes (i.e., block, ball, triangle,) one of which is the same as the stimulus shape. Can the child visually recognize the shape which is the same as the initial shape presented? Have him point to the one that is the same. Vary backgrounds, sizes, and colors of the shapes. Move from gross differences between shapes to more similar shapes.

Lesson 8:

Objective: Child will identify solid geometric shapes.

Activities:

Do the same as Lesson 7. Have the child verbally identify the shape.

Lesson 9:

Objective: Child will discriminate solid geometric shape from pictorial representation.

Activities:

Show the child three pictures of the same object (i.e., ball) and the same object in 3D form. Can the child point to the one that is different (not the same)? Vary the pictures experimenting with different colors, sizes.

Lesson 10:

Objective: Child will recognize pictorial representation of solid geometric shape.

Activities:

Show the child a 3D object and then a picture of the same object explaining that the picture represents the 3D object. When shown pictures of shapes or objects and corresponding 3D shapes or objects can the child match them correctly? Use objects familiar to the child. Be sure the pictures are bold and simple.

Lesson 11:

Objective: Child will discriminate vertical, horizontal and diagonal positions of objects.

Activities:

When shown three objects (i.e., popsicle sticks, straws, etc.), in the same position and one in a different position (i.e., three horizontal, one vertical), can the child point to the one that is different?

Show the child a card on which two or three drawn lines are in the same position and one is in a different position. Can the child point to the one that is different? Vary the thickness and colors of the drawn lines as well as the contrasting background.

Lesson 12:

Objective: Child will recognize vertical, horizontal and diagonal positions of objects.

Activities:

When shown an object in a specific position and then three more objects, two in different positions and one in the same position, can the child match the ones that are in the same position as the example presented?

Do the same as above using drawn lines. Again, vary thickness and colors of the drawn lines as well as the contrasting background.

Lesson 13:

Objective: Child will identify pictorial representations of solid geometric shapes in varying positions in space.

Activities:

The child is to name two dimensional form (solid colored) in any way it is turned.

Example One: The teacher shows the child a shape on a sheet of paper and tells the child to name it. The shape is then shown to the child turned 90 degrees and the child is again told to name the shape.

Example Two: The child is shown a variety of shapes turned at various directions and is told to name each of them as they are shown.

Level IV

The child must utilize the critical features of basic shapes as they appear in outline form.

Lesson 14:

Objective: Child will discriminate picture outlines of geometric shapes.

Activities:

The child is to tell the difference between a solid (blacked in) form and a shape but only in outline. The shapes being those found on functional signs.

Example One: The child is shown three shapes, all the same except that one is outlined and the other two are solid forms. The teacher tells the child to point out the one that is different. This is also done with the two outlines and one solid form.

Example Two: The child is shown four shapes, all different, one in outline, the other three solid colored. The teacher tells the child to point to the one that is different. This is also done with three outline and one solid form.

Lesson 15:

Objective: Child will recognize geometric shapes in pictured outline form.

Activities:

The child does not have to name the object but rather to match the outlined object with a similarly shaped outline form. (Those shapes having a relationship to those on functional signs.)

Example One: The teacher shows the child one outlined form followed by three more outlined forms, one of which is a duplicate of the first outline form. The teacher tells the child to point to which of the outlines in the group is the same as the first one. This should be done with a number of different shapes. Similar outlines are not used in this step.

Example Two: Do the same as above but with more complex outline shapes (other than the basic shapes.)

Example Three: The same as above but with shapes that resemble the initial outline.

Lesson 16:

Objective: Child will identify geometric shapes in pictured outline forms.

Activities:

The child should be able to name what the object shown to him in outline form represents. The objects shown in outline should be related to those shapes found on functional signs.

Example One: Start with the outline of simple forms such as squares, rectangles, circles. The child can identify these as blocks, balls, etc., as well as circle or square and still be correct.

Example Two: After the child has developed a mastery over naming simple shapes in outline, more complex, yet still familiar shapes are used. These can include the outline form of a man, woman, car, or familiar animal. (It must be positively established that the child is familiar with the more complicated object before it is used.)

Lesson 17:

Objective: Child will identify incomplete geometric shapes in pictured outline form, using closure.

Activities:

The child should be able to tell the teacher what the teacher has drawn on a piece of paper with a magic marker even though a section of the drawing (no more than one quarter of the figure) has been left out of the drawing. The shapes being those most often found in functional signs.

Example One: The outlines used should be simple forms such as a square or rectangle with one corner missing. The child can be asked to fill in the missing part or merely to name the shape.

Example Two: An outline can be used with a side missing but this can lead to more than one correct response. An uncoupled outline such as ⊔ can be completed either □ or ⌂ and both are correct. The object is for the child to complete the outline. If he can find more than one correct answer, all the better.

Lesson 18:

Objective: Child will discriminate letters from non-letter outline forms.

Activities:

The child should be able to tell the teacher that the shape shown is a letter and that such shapes as a square, rectangle, and others are non-letter shapes. The child does not necessarily have to be able to name the letters but the naming of the letters during the lessons is to be encouraged.

Example One: Initially use upper case letters and show one of these letters with a form that has a great difference from a letter. After going through a series of correct responses:

Example Two: Show the student

an upper case letter along with a form that is more closely resembling a letter than the above. After this has been done, successfully a number of times, have the student pick out the correct letter from two non-letter forms that resemble letters.

Example Three: Show the student a series of letters and non-letters such as A□△O..., and have the student point out the letters from the non-letters.

Level V

To read functional signs containing pictured representations, the child must utilize his perceptions of basic shapes to classify familiar objects into higher-order categories.

Lesson 19:

Objective: Child will identify solid forms of familiar objects.

Activities:

The teacher will present solid pictures of familiar and environmental objects. The child will verbally identify the objects. The pictures should vary in color and size.

Lesson 20:

Objective: Child will integrate parts of solid pictured objects into wholes.

Activities:

The teacher will prepare solid pictures of familiar and environmental objects. Each picture should be cut into two or three pieces, like a puzzle. The child combines the pieces of the puzzle into the whole object. Wooden puzzles of familiar objects can be used. Magazines will provide good pictures of solid objects.

Lesson 21:

Objective: Child will identify incomplete, pictured, solid objects.

Activities:

Teacher will have solid pictures of objects for the children to view. Each picture will have a part missing. Example: bicycle without handlebars. The student should verbally identify the object with the part missing. The discrimination can go from a small part missing to a greater portion of the picture missing.

Lesson 22:

Objective: Child will identify outlined pictured objects.

Activities:

The teacher will present outline pictures of familiar and environmental objects. The child should verbally identify the objects. The outlines should vary in color, be black on white paper or white on black paper and be different sizes.

Lesson 23:

Objective: Child will integrate parts of outlined pictured objects into wholes.

Activities:

The teacher will prepare outline pictures of familiar and environmental objects. Each picture should be cut into two or three pieces, like a puzzle. The child should combine the pieces of the puzzle into the whole outlined object.

Lesson 24:

Objective: Child will identify incomplete, outlined, pictured objects, using closure.

Activities:

Teacher will prepare outlines of familiar objects for the student to view. Each outline should have a part missing. Example: A car without wheels. The student should verbally identify the object with the part missing. Teacher will prepare outlines of familiar objects for the student to view. Each outline should have a part missing. When presented with 3 or 4 pieces of paper on which are outline forms, he will choose the piece of paper which, when inserted in place, will correctly complete the outlined picture. He will identify the completed picture.

Lesson 25:

Objective: Child will discriminate pictures of familiar objects.

Activities:

The child is shown four pictures of objects, three the same and one different. The child will point to the one that is different. Use of concrete objects is recommended for above procedures.

Example: Use three sets of keys and one watch. Which one is different?

Pictures of functional signs should be used: three the same, one different. Identify the different one.

Lesson 26:

Objective: Child will recognize pictures of familiar objects.

Activities:

The child will, when shown an initial picture of an object, point to one in a group of four that is the same as the example. Use of concrete objects is recommended.

Example: When shown a pencil, the child will pick up a pencil from a group of objects on his desk.

Vary size and color of pictures. Use outlines as compared to solid pictures.

Lesson 27:

Objective: Child will identify pictures of familiar objects.

Activities:

The child should verbally identify familiar objects from his environment when pictures are presented to him. These objects will be from his indoor environment. Example: chair, table, house, dishes.

The child will progress and verbally identify objects in pictures in his outside environment. Example: mailbox, fire plug, tree. Continue identification of objects to be incurred on functional signs. Example: Bicycle, woman, men, picnic area, bus, stairs.

Level VI

To read functional signs containing words or numbers, the child should attend to the critical features of letters or numbers.

Lesson 28:

Objective: Child will discriminate critical features of letters.

Activities:

Teacher will give child worksheet with four features, three the same and one not the same. Child will pick the one that is not the same. Example: curves, openings, vertical lines, horizontal lines. Start with three the same, one not the same. Progress to two the same, two not the same, then to all the same or all different.

Lesson 29:

Objective: Child will recognize critical features of letters.

Activities:

Teacher will give child worksheet on which is a certain critical feature and a group or sequence of features. Child will demonstrate or point to the one that is the same as given. Teacher may also show the child the feature, then have the child pick one that is the same.

Lesson 30:

Objective: Child will discriminate one capital letter from another.

Activities:

Teacher will prepare worksheet of four capital letters, three the same and one not the same. Child will show the one that is different of all the ones that are the same. Progress from one not the same to two not the same, all different, all the same. Child can use 3D letters at first and trace with finger.

Lesson 31:

Objective: Child will recognize capital letters.

Activities:

Given a capital letter and a series of letters, the child will point or verbally tell when the same letter as given is shown. For example, when shown a flash card and a random group of letters (4 or 5) with one the same as given, child will match letter shown on flash card.

Lesson 32:

Objective: Child will identify all capital letters.

Activities:

Child will name all letters when shown. When shown pictures or objects, child might name the letter it begins with. When given a letter, child will name a word that begins with the letter.

Lesson 33:

Objective: Child will discriminate lower case letters.

Activities:

Teacher will prepare worksheet of four lower case letters, three the same and one not the same. Child will show the one that is not the same. Progress from one not the same to two not the same, to all the same, to all different.

Lesson 34:

Objective: Child will recognize lower case letters.

Activities:

Given a lower case letter and a series of letters, the child will point or verbally tell when the same letter as given is shown. Flash cards are good to work with.

Lesson 35:

Objective: Child will identify lower case letters.

Activities:

Child will name the letters upon request as shown. Child points to the letter said from group of letters when teacher verbalizes letter.

Lesson 36:

Objective: Child will discriminate numbers.

Activities:

When shown four numbers, three the same and one different, the child will point to the one that is the same. Example: 7 7 7 3.

Lesson 37:

Objective: Child will recognize numbers.

Activities:

When shown a number, child will point or verbally tell when the same number has been presented. Child will match numbers printed in different colors and sizes and when shown on objects.

Lesson 38:

Objective: Child will identify numbers.

Activities:

Child will name the number as presented. Present numbers in order, reverse, mixed, one at a time, different sizes, different colors and in any order.

Level VII

The child must utilize his perception of letters, and the critical features of words, to identify the words and assign meaning to signs.

Lesson 39:

Objective: Child will discriminate functional words.

Activities:

The child tells the difference between different functional words.

Example One: Start with words that are greatly different and move toward words that are similar.

Have four words, three functional words and one different functional word:

stop stop stop gentlemen

The child is to point to the one that is different.

Lesson 40:

Objective: Child will recognize functional words.

Activities:

To accomplish this the student is to match functional words, not necessarily name them.

Example One: Show the student a word, then a group of four more functional words with the original word among them. The child is told by the teacher to point to the word that is repeated:

stop go men stop women

yield: ladies stop yield gentlemen

Lesson 41:

Objective: Child will identify functional words.

Activities:

Repeat previous activities, having child name words.

Lesson 42:

Objective: Child will utilize environmental clues for the meaning of the word.

Activities:

Words that the child does not know as nonsense words must be used. The child determines the meaning of the strange words by use of the words surrounding it in the sentence or where it is placed as a sign.

Example One: The use of a nonsense word in a sentence as a direct replacement for a known word.

"Jack and Jill went flump the hill to fetch a pail of water."

Example Two: The determining of the meaning of a sign by its placement:

The teacher tells the student to explain why the words "Men" or "Women" would be on a doorway.

The sign that says "One Way" often has an arrow in the sign. The teacher tells the student to explain why and what the arrow means.

Example Three: The teacher takes the child for a walk and talk, explains and questions the child as to why the signs he encounters are there.

Lesson 43:

Objective: Child will understand the direction or activities designated by sign.

Activities:

The child begins to understand that simple words or signs or phrases on signs have an idea behind them for which they stand.

Example One: The teacher shows the child a simple word or phrase and tells the child to explain what the word or phrase means. The child must be encouraged to explain the why and what of a word and since the child will be using his own words, the responses may be varied.

Example Two: The teacher tells the student to make up a word or picture sign that expresses an idea. (Example: such ideas as, not running in the halls, being quiet for various reasons.)

What would the student use as a sign or label to let everyone know that something belongs to him?

Lesson 44:

Objective: Child will assign meaning to functional signs.

Activities:

Take child outside. Child will verbalize what is indicated by signs which he encounters.

A SURVEY OF LOW VISION CLINICS IN THE UNITED STATES REGARDING THE TRAINING & EMPLOYMENT OF THE LOW VISION SPECIALIST

By Terry Parker*

Attention has been given to the possibility of creating low vision specialist training programs. Input is needed from the field -- more specifically from low vision clinic directors and administrators themselves -- regarding their feelings toward such a person as the low vision specialist, their manpower needs, and how financially able most would be to hire such a staff member. Feedback is also needed from the field regarding the scope of responsibility that should be delegated to the low vision specialist, and how training needs could be met through coursework, internships, etc. In order to obtain this needed information, a job description for the low vision specialist and a questionnaire were prepared and sent to 67 of the approximately 150 low vision clinics in the United States which are known to the American Foundation for the Blind (New York). No attempt was made to survey all 150 clinics due to a lack of financial resources. Instead, a representative sample of low vision clinics of all sizes and from all geographical areas of the United States was surveyed.

The job description formulated for purposes of this survey was as follows:

THE LOW VISION SPECIALIST

Job Description

The Low Vision Specialist is an individual trained to assist the ophthalmologist/optometrist in providing a comprehensive low vision evaluation and training program to the low vision patient. His/her responsibility is, first of all, to determine the patient's functional vision by evaluating him on various distance and near vision tasks such as his ability to read the newspaper, to watch TV, to read street signs, to locate house numbers, etc. Of course, the patient's own needs, goals, and expectations are carefully considered in the functional evaluation process. The Low Vision Specialist will also assist the ophthalmologist/optometrist in the optical evaluation for low vision aids. After the aids have been prescribed, he will have the responsibility of training the low vision patient to use his aids properly in the field environment (i.e., home, work, neighborhood). The Low Vision Specialist will also be responsible for making periodic follow-ups to the patient's home and/or work environment in order to assure that the patient continues to use his aids properly and efficiently. In addition, when necessary, he/she will be skilled in instructing the low vision patient to use his residual vision more efficiently without the use of low vision aids, with special emphasis being given to assisting the patient in becoming aware of his visual limitations. This training phase of the low vision program is designed to free the ophthalmologist/optometrist from the time-consuming task of training the patient in the use of his aids, and/or residual vision, while at the same time providing a more comprehensive service to the patient through the team-work approach.

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*Orientation and mobility specialist. This study was undertaken as a part of course-work within the Dept. of Blind Rehabilitation; Western Michigan University, Kalamazoo, Michigan.

The Low Vision Specialist will also have the responsibility for office management of the low vision clinic, including the scheduling of appointments, supervision of support staff, and the maintenance of adequate office supplies, equipment, etc.

This program is designed not only for those interested in becoming Low Vision Specialists, but also for the professional (i.e., Rehabilitation Counselor, O & M Specialist, Rehabilitation Teacher, Special Education Teacher) or the college student anticipating the completion of a degree in a related field (i.e., social work) who wishes to acquire an additional area of expertise.

Course outline:
- Definitions of low vision
- Psycho/social aspects of blindness
- Eye diseases related to low vision
- Community Resources
- Evaluation of functional vision
- Optics
- Optical/non-optical low vision aids
- Training techniques with/without aids for the low vision patient
- Office and clinic management
- Supervised internship

The questionnaire prepared for submission to the 67 low vision clinics around the United States consisted of 10 yes/no and short-answer questions. Thirty-four of the 67 questionnaires were returned for analysis.

ANALYSIS OF RESPONSES

1. Do you see the need of such a person as the Low Vision Specialist in the provision of low vision evaluation/training services to the low vision patient?

Yes - 32 responses
No - 2 responses

2. Would you be interested in hiring such a person as outlined in the enclosed job description?

Yes - 21 responses
No - 9 responses
No answer - 4 responses

Of the 9 negative responses, one indicated that his clinic operated on a part-time basis only, thus not allowing for an additional staff member. Another respondent stated that the services of his clinic were donated by a low vision specialist (presumably an ophthalmologist or optometrist), and a third person indicated that his patient load was too small for a full-time low vision specialist. Thus, it appears that at least 3 and possibly more of the 9 negative responses were due to situational/financial factors rather than negative reactions to the concept of a low vision specialist.

3. What kind of academic background would you prefer for a person entering the Low Vision Specialist training program? ( )Bachelor's Degree; ( )Master's Degree; ( )High School Diploma; ( )Specialized training in a related area such as orientation and mobility and/or rehabilitation teaching (You may check more than one box).*

High school dip. - 1 response

High school dip.+ specialized training in a related field - 4 responses

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*Editor's note:
My count shows:
High School Dip.- 7
Bachelors - 19
Masters - 8
Specialized - 28

Bachelor's degree - 3 responses

Bachelor's degree + specialized training in a related field - 13 responses

Either high school diploma or bachelor's degree - 1 response

Either high school diploma or bachelor's degree + specialized training in a related field - 1 response

Master's degree - 0 responses

Master's degree + specialized training in a related field - 7 responses

Either bachelor's degree or master's degree - 1 response

Either bachelor's degree or master's degree + specialized training in a related field - 0 responses

Academic background not important, but person should have specialized training in a related field - 3 responses

It does not appear there is any great concensus of opinion on the academic background that should be required of persons entering the low vision specialist training program. Only 6 of the 34 respondents felt that a person should enter a low vision assistant training program with only an academic credential without any previous exposure to a related area such as rehabilitation teaching or orientation and mobility. An additional 3 respondents felt just the opposite -- that academic background is not important, but rather that a person should have had specialized training/experience in a related field before entering the program.

The other 25 respondents were of the opinion that an individual entering the low vision specialist training program should have an academic background plus specialized training in a related field.

If one looks at the statistics solely on the basis of academic achievement level recommended for entering the low vision specialist training program, one-half of the respondents who place value on previous academic achievement (31 of 34 respondents) feel that a bachelor's degree is satisfactory for entering the low vision specialist training program. The other one-half are more or less equally divided between those who feel a high school diploma is sufficient for entering the program and those who feel a master's degree is necessary.

4. Do you think the Low Vision Specialist training program should be a part of an already established program such as teacher education (special education), rehabilitation teaching, or orientation and mobility; or should the program be a separate, specialized one?

   A. The Low Vision Specialist training program should be a separate, specialized one --

      14 responses

   B. The Low Vision Specialist training program should be part of an already established program in a related field --

      16 responses

   C. No answer --

      4 responses

The breakdown of responses to this question indicates an almost even split between those desiring a separate, specialized program and those preferring a curriculum which is part of an already established program in a related field.

5. What salary range would you feel the Low Vision Specialist should receive?

$ 8,000 - 10,000 - 8 responses
10,000 - 12,000 - 12 responses
12,000 - 14,000 - 7 responses
Above $14,000 - 5 responses

Five respondents indicated that salary level was difficult to determine since it would depend upon an individual's background, experience, additional skills, the geographical area in which the clinic was located, and the agency for which the person works.

6. In order to complete the requirements of a program, do you think that the Low Vision Specialist trainee should be required to complete an internship in an approved facility? ( )Yes ( )No

Yes - 30 responses
No - 3 responses
No answer - 1 response

7. Would you be interested in accepting a trainee for an internship in your facility? ( )Yes ( )No

Yes - 19 responses
No - 15 responses

Of the 15 negative responses, additional comments were as follows:

*Clinic is not big enough for such a staff member; low income clinic; clinic lacks facilities; clinic operates on a part-time basis;

*Agency has no formal low vision clinic;

*Interested in accepting intern only if he is trained in orientation and mobility or rehabilitation.

8. How many patients does your facility service on the average in a year? (Range -- 5 to 35,000 individuals served per year)

Respondents were from clinics which varied greatly in regard to the number of patients served each year. Due to the very large numbers quoted by two low vision clinics (19,000; 35,000), it is felt that the mean of 2292.3 clients served per year is not representative of the size of the majority of the clinics responding to the questionnaire. Therefore, the data is further broken down as follows:

Clinics serving:
from 1 - 100 pts/yr.- 10 responses
from 101 - 200 pts/yr.- 6 responses
from 201 - 300 pts/yr.- 6 responses
from 301 - 500 pts/yr.- 1 response
from 501 -1000 pts/yr.- 3 responses
from 001 -1500 pts/yr.- 1 response
over 1500 pts/yr.- 4 responses
No response - 3 individuals

The above analysis reveals that approximately 52% of the clinics responding service no more than two hundred patients per year, 26% service no more than six hundred patients per year, with the remaining 22% servicing more than six hundred patients per year.

The analysis reveals that nearly all of the clinics, regardless of size, were in agreement that the low vision specialist is needed in the provision of services. The smaller clinics (serving 1 - 200 clients per year) were unanimous in their affirmative response. This is surprising since it was anticipated that many of the smaller clinics would not see the need of a low vision specialist. Furthermore, the smaller clinics were again unanimous in their desire to hire trained low vision specialists. Again, this seems surprising due to their reduced patient load. The medium-size clinics (serving 201 - 600 clients per year) had mixed responses regarding the need of low vision specialists, with the affirmatives having a 2:1 majority. The medium-size clinics were almost equally divided with regard to their interest in hiring a low vision specialist. The larger clinics (1000+) were also unanimously affirmative regarding the need of low vision specialists. However, they were divided on the idea of hiring the low vision specialist, with the affirmatives having a 2:1 majority.

In regard to salary ranges, there appears to be no relationship between size of clinic and salary.

Regarding the need of internships for low vision specialists, the smaller clinics were again unanimous in their affirmative response, and were also in favor by a 3:1 margin of accepting trainees for internships.

9. Of the course requirements listed on page one of the job description, do you have any additional suggestions?

The comments to this question fall in several categories: 1) Trainees should receive more exposure to the general area of blind rehabilitation, 2) related courses such as basic ocular anatomy, medical terminology, courses in developmental vision, visual perception, sensory perception, and visual concepts, and general ophthalmic technician skills should be included in the curriculum, 3) trainees should have more exposure to related areas such as social work techniques, counseling techniques, principles of case history-taking, ethics, rural sociology, the psychology of learning, geriatrics, and an understanding of other medical factors such as diabetes which play a part in vision loss.

10. Do you have any additional suggestions regarding the establishment of a training program such as the one outlined in the enclosed job description?

There was dissatisfaction expressed regarding the title "low vision specialist". Some respondents also discouraged the formation of a new training program, and suggested instead that existing programs for optometric assistants and optometric technicians be used. Other suggestions included on-the-job training in a busy clinic under the supervision of a person knowledgeable in low vision, or training the low vision specialist in a non-clinical environment such as a rehabilitation center or school for the blind and visually impaired. Some respondents felt the low vision specialist should be an optician primarily.

SUMMARY

A total of 34 completed questionnaires and 2 letters were received from low vision clinics in all parts of the United States. The results are summarized for quick reference as follows:

*91% of the respondents felt there is a need for low vision specialists in the provision of low vision services.

*62% of the respondents indicated interest in hiring such an individual as the low vision specialist.

*74% of the respondents felt that an academic background plus specialized training in a related field such as orientation and mobility, special education, or rehabilitation teaching were important for an individual entering the training program.

*18% felt that an academic background was important for a person entering the program, but no specialized training in a related field was needed.

*8% felt that academic background was not important for a person entering the program, but that the person should have specialized experience or training in a related area.

*50% of the respondents felt that a bachelor's degree is satisfactory for entering the low vision specialist training program.

*21% felt that a high school diploma is sufficient.

*21% felt that a master's degree is necessary.

*8% had no opinion regarding academic achievement level that should be required.

*41% of the respondents felt that a low vision specialist training program should be a separate, specialized one.

*47% felt that the program should be part of an already established program in a related field.

*12% had no opinion in regard to a separate or an integrated program.

*Salary ranges specified for low vision specialists were as follows:

$ 8,000 - 10,000 -- 24% of respondents
10,000 - 12,000 -- 35% of respondents
12,000 - 14,000 -- 20% of respondents
Above $14,000 -- 6% of respondents
No answer -- 15% of respondents

*88% of the respondents felt that a low vision specialist trainee should be required to complete an internship in an approved facility.

*56% of the respondents indicated an interest in accepting low vision specialist trainees for internships in their facilities.

*52% of the respondents were from clinics serving no more than two hundred patients per year.

*26% of the respondents were from clinics serving no more than six hundred patients per year.

*22% of the respondents were from clinics serving over six hundred patients per year.

CONCLUSIONS

On the basis of this survey, there appears to be a need for low vision specialists. However, further study should be devoted to the determination of how many clinics would actually be able to hire low vision specialists in order to avoid overproduction in this field. Consideration might also be given to what is the most appropriate job title. Persons accepted for training should have an academic background, and trainees should have had some previous training/exposure to fields related to blindness/visual impairment. The program could either be a separate, specialized one or incorporated into an already existing program, and should include an internship.

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GUIDE TO FINANCIAL SUPPORT FOR LOW VISION PROGRAMS

Compiled by Marianne May

Following sources of potential financial support for low vision programs and research based on search of Foundation Grants Index 1976 (last six months of 1976) and Foundation Directory 1976 at the Foundation Center, New York.

Key words search included handicapped, rehabilitation, social services, aged, child development, education, blind, diabetes research, eye diseases, aged health programs.

The following booklets on philanthropy and proposal writing can be obtained free of charge (up to 5 copies) from The Foundation Center, 888 Seventh Ave., N.Y., N.Y. 10019.

What Makes a Good Proposal? by F. Lee Jacquette and Barbara L. Jacquette

What Will a Foundation Look for When You Submit a Grant Proposal? by Robert A. Mayer

Philanthropy in the United States: History and Structure. by F. Emerson Andrews

For information on federal assistance, readers can consult Federal Assistance for Programs Serving the Visually Handicapped (3rd Ed.). by Barbara D. McGarry, published by The American Foundation for the Blind, N.Y., N.Y., 1977.

Code: N.I. = No aid to individuals
H = High figure quoted for a past grant
L = Low figure quoted for a past grant

(When available, example of actual area funded in past is included at end of foundation's entry.)

The Buhl Foundation
Four Gateway Center, Room 1724
Pittsburgh, Pa. 15222

Grants to institutions in Pittsburgh area with special interest in education at all levels and in regional concerns. H $129,000 L $750

Chicago Community Trust
208 S. LaSalle Street
Chicago, Ill. 60604

For improvement and relief of Cook County residents; operating budget for health and medical care, family services, community planning and special service. N.I.
H $100,000 L $1,000
"psychological counseling for handicapped and family"

Child Development, Foundation for
345 E. 46th St., Room 700
New York, N.Y. 10017

Support research and service experiments to identify environmental conditions that encourage healthy growth and development of child.
N.I. H $53,120 L $52

Cincinnati Foundation, Greater
812 Gas & Electric Building
4th & Main Street
Cincinnati, Ohio 45202

Broad; interest in R&D projects dealing with aid for handicapped, health agencies, education including voc training, med education, preschool programs. N.I.
H $12,000 L $45

Edna McConnell Clark Foundation
250 Park Avenue, Room 900
New York, N.Y. 10017

Broad purposes; concentrate on children, elderly (helping them to contribute to society and be employed) poor, people of developing countries. N.I.

Cleveland Foundation
700 Natl. City Bank Building
Cleveland, Ohio 44114

Assist public charitable or educational institutions in Ohio; promote education and scientific research; care for aged.
H $1,000,000 L $14

Gannett Newspaper Foundation, Inc.
49 S. Fitzhugh Street
Rochester, N.Y. 14614

General purposes; promotes health, welfare, well-being of population in communities served by Gannett newspaper and broadcasting stations.
H $50,000 L $305

Grant Foundation, Inc.
130 E. 59th Street
New York, N.Y. 10022

Support projects and programs contributing new knowledge on nature and development of human mind; emphasis research into biology, psychology, social development. Preference given younger, less well established investigators and new research programs in initial stage of development. Limited support new programs, training, applied research and service of demonstrational nature. N.I. H $300,000 L $1,000 "early child development research," "vestibular and motor development in child"

John A. Hartford Foundation, Inc.
405 Lexington Avenue, Suite 5115
New York, N.Y. 10017

Broad; emphasis on "biomed research projects aimed at advancing previous diagnosis and therapy of specific disease states or bodily dysfunctions for which present knowledge is unsatisfactory or lacking." Preference to investment at hospital or med school in U.S. and Canada. N.I. H $100,000 L $20,000

Hyams Fund, Inc.
One Boston Place, 33rd Floor
Boston, Mass. 02108

Local charities including social agencies, child welfare agencies, health agencies, and hospitals. "social services for the blind; consulting and training"

Jennings Foundation
1100 Natl. City Bank Building
Cleveland, Ohio 44114

Curriculum development projects, school evaluation studies. Ohio only. H $75,000 L $200

Johnson Foundation, Inc.
P.O. Box 346
Palm Beach, Fla. 33480

Broad; emphasis education. Florida and Indiana. H $25,000 L $50 "improve methods for evaluation of health care facilities"

Kaiser Family Foundation
Two Palo Alto Square
Palo Alto, Calif. 94304

Programs in medicine; emphasis health care delivery, medical and paramedical education; problems in medical

Kaiser Family Foundation (continued)

solution of which calls for joint efforts of professionals of various disciplines. N.I. Also small scale support of public agency programs in Bay area. "health services for handicapped"

Kresge Foundation
2401 W. Big Beaver Road
Troy, Mich. 48084

Broad; grants primarily for building construction or renovation, major capital equipment; grants to institutions of higher education, hospital, health-related services, care of aged. N.I. No support research program. H $11,250,000 L $1,000 "diabetes center building"

W. K. Kellogg Foundation
400 North Avenue
Battle Creek, Mich. 49016

Aid to programs concerned with application of knowledge; interest in education, health. Aid institutions and agencies in North America, Latin America, West Europe and Australia. H $1,175,000 L $2,000

Milwaukee Foundation
110 E. Wisconsin Avenue
Milwaukee, Wis. 53202

Health facilities and aged interest; benefit persons in greater Milwaukee area. N.I. H $99,000 L $967 "develop plans for nursing facility for blind," "develop program for children's eye care," "voc training and placement of handicapped"

Permanent Charity Fund Inc., Committee of the
One Boston Place
Boston, Mass. 02106

Support health, welfare, education, and recreation programs and institutions in metro Boston; grants for start-up expenses of new or experimental programs of established and new institutions, as well as for capital needs, coordination and planning projects. N.I. H $75,000 L $50

Public Welfare Foundation, Inc.
2600 Virginia Avenue, N.W., Room 511
Washington, D.C. 20037

Grants for education, child welfare and youth agencies, health services International. No grants for scienc research, general research or

Public Welfare Foundation (continued)

capital investment.
H $25,000 L $500

Rowland Foundation, Inc.
P.O. Box 13
Cambridge, Mass. 02138

Broad purpose. N.I.
H $754,725 L $500
"handicapped child and adult"

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EDITORIAL -- LOW VISION CITIZENS

Where are they? There are too few low vision citizens involved in the development of low vision services. Those who are involved are superb and helpful individuals, but there are too few of them. Look at the statistics. I don't care how you analyze them, you will still come out with at least four low vision persons to each person with no useful vision. These statistics are used constantly to justify services.

Where are they? There are too few low vision citizens active in advocacy organizations. There are no interest groups in which they can express their needs. There are no laws to protect their benefits and services and no one stands with them if they are treated unfairly. Where are they? Where are the people who know that nine out of ten low vision people with aids and training would be able to read print? Where are the low vision citizens who realize with proper aids and skills they can return to work? Where are the low vision persons who take an interest in services to other low vision people?

Where are they? Low vision citizens are there, but they may not feel welcome -- welcome to serve on boards and committees, welcome to promote services, welcome to raise funds for low vision clinics, welcome to act as volunteers in low vision clinics, welcome to find others who desperately need help, welcome to belong to organizations of the blind, welcome to have their needs recognized by such organizations, welcome to have their needs recognized by agencies serving the blind, and in general, welcome to have a place in the services that were justified by using their statistics.

Where are they? They are there. Their numbers and needs represent a challenge to organizations of and for the blind to broaden services and representation, to double or triple in numberical size and to increase a great deal more than that in impact.

L. E. A.

03177-01

Practice Effects Upon Performance with Low Vision Aids. (paper presented to the Low Vision Subsection, American Academy of Optometry, Portland, Oregon, December 1976). GOODRICH, Gregory; MEHR, Edwin; QUILLMAN, Robert; SHAW, Helen; FROST, Alan and WILEY, Kenneth. Western Blind Rehabilitation Center, VAH, Palo Alto, California

Fifteen new low vision aids and 15 new closed circuit T.V. users were given ten days of training of up to one hour per day. They were timed for their reading duration of up to one hour and their reading speed was tested on a random basis throughout the training at any time during the practice session. The authors began their work by noting the lack of information of practice effects in the L.V. literature. Instruction was given to the users as needed to facilitate proper techniques for the use of the aids. Throughout the test, reading speeds rose steadily, for both closed circuit T.V. and low vision aids. It did not appear to peak during the ten day period. Reading duration rose very rapidly the first few days on closed circuit T.V. but at a more gradual rate with optical aids. The study cannot answer the question of practice without training because training was available in this instance. It was also clear that a brief period of practice with closed circuit T.V. was not sufficient to determine the utility of the device to the user.

The article is a short punchy piece of great importance to the field. Let us hope that Dr. Goodrich and his colleagues will now present some of their data in table form, with any future studies of larger sample.

(L.E.A.)

03177-02

Low Vision Training for Mobility Purposes* (a short course). NATIONAL MOBILITY CENTRE, Birmingham, England, May 1976, 11p.

The National Mobility Centre, Birmingham, England, annually convenes a short course for mobility officers and other blindness services personnel. One hundred thirty four attendees heard the material presented by L. E. Apple and Marianne May Apple. A survey by Peter Ryan indicates that mobility officers in England are working with clients who are not totally blind and are not necessarily long-cane users. He called for mobility personnel in England to formulate a uniform structure of training for low vision clients during the next three years.

It was suggested by L. E. Apple that low vision be conceived of as a separate disability for the purposes of structuring an approach which will deal with it effectively. The personal and social implications of low vision were outlined first; the basic ambiguity of the disability and the social pressure which forces low vision individuals to identify themselves on one or the other end of the visual scale. Low vision persons will learn adaptive behavior but many will restrict their movements and thier responsibilities because of lack of experience and knowledge, which might be gained through training programs. Common types of field losses were discussed along with their effects on visual function. Some practical "dos and don'ts" were innumerated.

"Consider Me Seeing,"** a videotape, was presented and discussion followed. Among children, the presence of residual vision is very frequently first identified by mobility instructors. Training is extremely useful in the development of visual performance. Practical matters relating to posture of low vision children, safety limits, vision and social identification was discussed.

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*This report includes "Low Vision Practicum" abstracted in Low Vision Abstracts, Fall 1976. (02476-05)

**Documentary of low vision stimulation program for mobility purposes at Western Pennsylvania School for Blind, available on loan from A/V Dept., Hillman Library, Univ. of Pittsburgh, Pittsburgh, Pa. 14213

A second film*** dealt with low vision training environments and techniques used with vets. There was an effort to show the technical aspects of selecting an environment and ordering the selected environments to achieve certain mobility objectives; eighteen separate routes were identified on which eleven major objectives in mobility visual performance were to be achieved.

Each participant in the conference was given approximately three hours of mobility practicum using vision-reduction mono-goggles to experience the process of learning to cope with degraded visual environment under various lighting conditions and terraine. Two small groups assigned to each of three areas for activities: sidewalk travel, ball tossing and stair climbing, and their notes constitute a valuable part of the conference contents.

Low Vision and the philosophy surrounding it were discussed by M. Apple who, beginning with the importance, strengths and weakness of clinical measures of vision for mobility purposes, furnished general guidelines for mobility training including guidelines for the use of the blindfold. Factors governing the visibility of the environment were reviewed followed by a discussion of the guidelines for the training of persons in the use of telescopes.

The article is thorough enough to be of some practical use to mobility specialists or rehabilitation teachers interested in this aspect of low vision.

(L.E.A.)

***Mobility Section
Western Blind Rehab. Center
V. A. Hospital
Palo Alto, California

03177-03

A New Concept in Low Vision Optometric Care at the Western Pennsylvania School for Blind Children (paper presented to the Low Vision Subsection American Academy of Optometry, Portland, Oregon, December 1976)
FREEMAN, O.D., Paul B.

An innovative program in 24 hour optometric care for low vision children has been developed between the Western Pennsylvania School for the Blind and the Pennsylvania College of Optometry involving fourth year optometry interns. It is their objective to identify and promote the utilization of vision by low vision children. A seasoned low vision optometrist leads the effort and supervises interns during their twelve-week stay at this school, whic provides them with room and board. Optometry interns perform follow-up services for the prescribing low vision optometrist, function as teacher's assistants to the classroom teachers, attend all staff meetings for professionals, and participate in training programs for parents of low vision children. The article contains sufficient data to be of value to residential schools or colleges of optometry planning or wishing to initiate similar programs. We look forward to future reports on this program from the interns themselves.

(L.E.A.)

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The Low Vision Interest Group of the American Association of Workers for the Blind (AAWB) has a very rich workshop and program planned for the national AAWB Convention to be held July 17-20, 1977. The meeting will be hosted in Portland, Oregon. We urge you to participate and share your knowledge in the Low Vision Interest Group sessions. For further information: Randy Jose, O.D., Low Vision Interest Group Program Chairman, c/o Center for the Blind, 36th & Lancaster, Philadelphia, Pa.

03177-04

The Use of Residual Vision in Orientation and Mobility. WILSON, Rod, Mobility News (England), Nov-Dec. 1976, 39, 4-8.

Factors to be taken into account when deciding whether a person should be trained using residual vision or traditional "blind" methods under the blindfold are: prognosis, visual acuity, and eye condition. When the client's needs have been assessed, choice of mobility aid and adapting of a standard training program is made on an individual basis. Examples of adapted programs are given for representative cases: minimal training needed to restore confidence in an older client with limited travel goals; blindfold training in conjunction with training use of residual vision for an active traveler with severely restricted night vision; blindfold training with emphasis on sensory training for a client with impaired night vision who does not plan to use long cane.

(M.M.A.)

03177-05

A Comparison Study Between Black-Red, Black-Yellow Color Coding For Head Level Obstacle Detection. MASSANARI, Steven, K. Orientation and Mobility Program, Western Michigan University, Dec. 1976, 21 p.

A descriptive study relating to the communication skills and mobility of multiply-handicapped blind children, Massanari tested the relationship between head-level obstacle detection and color-coding combinations. Colored tape was used to highlight head level objects in 3 maze sequences. The three children tested had light projection or light perception based on low vision evaluation made by an optometrist and mobility specialist, and were limited to receptive language skills. Measurement of the test variables is on the basis of observation by an orientation and mobility specialist using a scoring system for obvious visual avoidance of an obstacle in the maze. Each child was tested individually going through 3 object sequences in the maze. Although the scoring instrument and test design were pre-tested, many difficulties were encountered in the administration of the instrument and weaknesses discovered in the design. It was difficult to determine through observation whether the object contact was due to impaired vision or mental deficiency based on unused and/or untrained residual vision, or environmental deprivation. The study's results are inconclusive although Massanari feels color coding improves object detection and could be transferred to environmental needs such as doorways and stairs to increase the multiply-impaired blind person's reaction time and makes suggestions for improvement of test design. The study includes a review of literature on color, illumination, and communication and speech problems of the multiply-impaired.

(M.M.A.)

03177-06

The Empathic Model - Getting Inside the Older Skin. Psychology Today Newsline. Psychology Today, March 1976, p. 95.

Workers at University of Michigan's Institute of Gerontology have devised the Empathic Model to approximate sensory loss of persons in their late 70's. The mechanical devices include coated lenses, ear and nose plugs, and a fixative to desensitize sense of touch. The Institute's environmental studies program under direction of Professor Leon Pastalon* utilize the simulation as an aid in developing ways of compensating for everyday problems that restrict the older person's independence and mobility. Common visual problems revealed include glare, fading of colors, poor depth perception, and slow light-dark adaptation. The Empathic model is being used to evaluate nursing homes and other housing and to recommend changes in lighting, color and other environmental factors. Slides and other materials have been developed for inservice training. A.A.R.P. (American Association of Retired Persons) is

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*Director of Environment and Aging Progr
Institute of Gerontology
University of Michigan
Ann Arbor, Michigan 48105

funding a study of older drivers and some of the visual difficulties they experience on the road.

(M.M.A.)

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PUBLICATIONS WORTHY OF READING

Interest in the many aspects of low vision care has rapidly increased in the past few years. There are many signs of this increase and notable among them are the two special low vision issues of the Optical Journal and Review of Optometry and the Journal of the American Optometric Association. The Review of Optometry's December 15, 1976 (volume 113, no. 12) contains articles on Fresnel Prisms, education of low vision patients, the role of AFB (co-authored by the Editor and Publisher of Low Vision Abstracts, Mr. Loyal E. Apple, incidentally, in his spare time, Mr. Apple is Executive Director of AFB), and a commentary by Mr. C. Warren Bledsoe on "Low Vision and the Office for the Blind and Visually Handicapped." The Journal of the American Optometric Association's contents includes articles on pathology in low vision evaluations, training low vision patients, a teacher/doctor coordinating form, eccentric viewing training, and community resources. We hope you will encourage these journals to continue devoting space and effort to the low vision field.

(G.G.)

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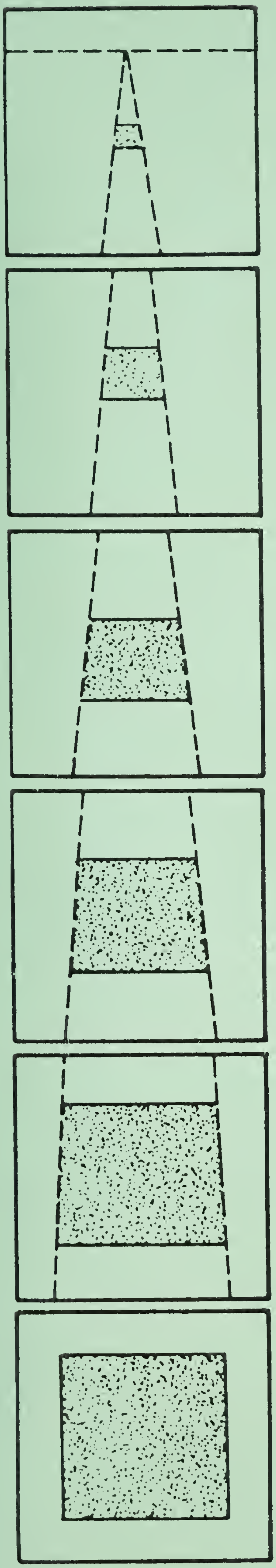

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LOW VISION ABSTRACTS promotes the information needs and skill growth within the areas of teaching the use of residual vision for low vision children or adults. When it began in 1971, the ABSTRACTS emphasized distance vision which drew the attention of orientation and mobility specialists. In 1976 the scope was broadened to include all areas of learning and phenomena which are related to low vision, both near and distance. This approach is designed to be of more use to the classroom teacher, the rehabilitation teacher and the rehabilitation counselor.

LOW VISION ABSTRACTS contains feature articles which deal with either research or practice, abstracts from the literature in the field, bibliographies and suggested research topics. The ABSTRACTS does not deal with optical aids as such, or pathology as such, since both these areas have their own well-developed literature.

LOW VISION ABSTRACTS is supported by students and faculty in both graduate and undergraduate programs of teacher preparation in the areas of blindness and visual impairment. Assistance to, and stimulation of work at this level is the basic commitment of the ABSTRACTS.

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LOW VISION ABSTRACTS

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CONTENTS

FEATURE ARTICLES

Visual Extinction: Some Speculations and Implications
James P. Welch...............1

Low Vision Workshop For Orientation and Mobility Instructors in West Germany
Dennis Cory..................5

ABSTRACTS

A Look at Commercial Goods and Their Uses as Low Vision Aids..6

Parameters of Success in the Use of Fresnel Prism Lenses....6

Peripheral Visual Acuity and Refractive Error: Evidence for "Two Visual Systems"?......6

Orientation and Mobility Project: A Low Vision Orientation and Mobility Evaluation...7

The Use of High Plus Reading Addition Lenses................8

The Physical Environment and the Visually Impaired: The Planning and Adaptation of Buildings and Other Forms of Physical Environment for Visually Impaired People.......8

A Detailed Look at Expanding the Visual Field with a Reversed Monocular............8

EDITORIAL -- AAWB SCORES COUP
Loyal E. Apple...............11

THE LOW VISION AWARD FOR GRADUATE EXCELLENCE...........................9

COUNCIL OF CITIZENS WITH LOW VISION BEING ORGANIZED................10

AAWB LOW VISION INTEREST GROUP..........12

LVA COPY REFERENCE SERVICE.............13

COVER:

The illustration is of successive transformation of the image of a square of pavement while a person is walking along a street. It was sketched from a figure given by J.J. Gibson in The Perception of the Visual World. "A transformation is a regular and lawful event which leaves certain properties of the pattern invariant.

The motif of Low Vision Abstracts is TRANSFORMATION of mobility, rehabilitation, and classroom teaching through an increased understanding of the visual environment of the low vision person.

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VISUAL EXTINCTION
SOME SPECULATIONS AND IMPLICATIONS

By
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Anchorage, Alaska

Extinction, fluctuation, formation of an empty field, ganzfeld, are all terms closely linked in the literature of vision research. For over fifty years, studies have been made of the effects of stabilized retinal images and the apparent link to extinc tion, or the formation of an empty visual field. More recently, concern about the extinction phenomenon has come from those more practically involved with visual impairment and the functional implications of extinction and fluctuation. Thus far, however, the most precise and useable information relevant to the phenomenon of extinction has come from laboratory studies and literature involved with stabilized retinal images and the visual perceptual system. Whereas the experimenters and authors of these studies examined stabilized retinal images and extinction in order to better understand the perceptual mechanisms of vision, this paper will look at extinction and the research surrounding it in order to better understand the practical applications and implications for people with certain visual impairments.

Extinction is easily described: during fixation at a given point, the image completely disappears after a certain period of time. The visual image in an affected region may also fluctuate in distinctness at a varying rate, or may disappear and reappear at a certain rate. This is called fluctuation (Bender and Teuber, 1946), and may actually be an incomplete form of extinction, sharing many of the same causes. But although extinction is easily described, it is not quite so easily explained.

Disruption (fluctuation) or extinction has been reported by Adrian (1928), Ditchburn and Ginsborg (1952), Riggs et.al. (1953) and studies most thoroughly by Yarbus (1956) (1967). From these studies, it is clear that for the human eye to function properly, it "requires some degree of constant (continuous or interrupted) movement of the retinal image." (Yarbus, 1967) Moreover, in 1956, through the use of technically superior testing methods, Yarbus was able to conclusively demonstrate that regardless of shape, color, angular dimension, or contrast between details, "that in every case, 1-3 seconds from the beginning of the experiment and after removal of all light of varying intensity passing through the sclera, all visual contours disappeared from the subject's field of vision. These contours did not reappear until the end of the experiment, i.e., for several minutes (unless something happened to disturb the constancy and strict immobility of the retinal immage.)" (Yarbus, 1967). Yarbus refers to this phenomenon as the formation of an empty field. The result is the same as that described by the term extinction.

It is interesting to note how truly difficult it was to finally obtain a completely stabilized retinal image and the resultant formation of an empty field. One need only look at the incomplete success of Ditchburn, Riggs, Ratliff and other experimenters of similiar stature to be impressed with the difficulty of the task. The heavy stands, head mounts, bite boards, elaborate optical appartus and recording equipment further emphasize the painstaking control necessary to eliminate interfering movement of the retinal image. Complete disappearance of the retinal image (extinction) for any extended period of time was finally achieved only through the use of sophisticated optical appartus in an extremely controlled laboratory situation. It is ironic that what has proved to be such a difficult and complicated experimental task is a fairly common and unwelcome occurence for many visually impaired individuals. As we shall see later, the phenomenon of extinction is not so far removed from naturally occurring situations as it might seem.

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*Orientation and Mobility Specialist

From Yarbus' discussion of the necessary conditions for extinction to occur in his experiments, it fol, lows, both logically and experimentally, that all that is necessary to make a stabilized retinal image reappear, is to unstabilize it; namely, to "disturb the constancy and strict immobility of the retinal image." (Yarbus, 1967)

It is not the movement of the eye itself which is responsible for the maintenance of the visual perception of an image, but the shifting of contours over the surface of the retina. Movement of a uniform image (i.e., without contour) over an immobile retina will not end the extinction process. Likewise, eye movement over a stable uniform image will also fail to make the image reappear and continue to result in an empty field.

In order for the retinal image to be reestablished, one of two events must take place. Either sufficient shifting of visual contour with respect to the retina must take place, or abrupt contrast changes within a limited frequency range must occur. These events occur quite naturally in the normal visual process, and as has already been noted, were only eliminated with great difficulty in a laboratory situation. Yet it is the inability of some people to produce either of these two conditions which is responsible for most cases of extinction and fluctuation. Part of the explanation may lie in a brief examination of what a "sufficient contour" implies.

Contour depends on changes in light density gradients and coordination of gradients into the boundaries of a figure. The point of steepest inflection defines the boundaries or contours. (Apple and May, 1970), (Hebb, 1949). "Sufficient contour" means that a gradient is visually detected. If the information being processed through the visual system is insufficient for the system to detect a contour, or if the visual system is impaired to the extent that it does not detect a contour, it is then possible for extinction to occur. A brief discussion of the perception of contours should make the importance of this aspect more evident.

Perception of contour is not only a function of intensity (the physical measurement of light energy) but of brightness (the perceived intensity). The fact that brightness is not a simple function of intensity may complicate the perceptual interpretation of an image, and more specifically, account for the failure to detect contours. That brightness does not depend upon its intensity is easily demonstrated by looking at an opaque colored or gray piece of paper with one eye under ordinary light at arm's length, "Then hold it up at arm's length, between the eye you have chosen and the bright sky or a large light source. Note that the paper looks much darker when it is in front of the light source than it did when it is normally illuminated, even though the actual amount of light reflected from the paper is the same." (Cornsweet, 1970)

The eye does not operate on the basis of detecting absolute values, but in the case of contours, on the basis of relative differences or changes. Cornsweet goes on to demonstrate graphically that the eye requires discrete changes in the intensity gradient in order to detect contours. "A system involving the mechanisms of recurrent inhibition transmits information about changes in intensity while suppressing information about steady levels in intensity. Information is transmitted well only if differences are abrupt in space and time." (Apple and May, 1970) (Cornsweet, 1969). Consequently, a change in intensity that is not abrupt, but is instead a smooth gradient, may not be detected. The result, perceptually, is that the contour does not exist.

When contours are not perceived in the visual field, the conditions simulate that of a stabilized retinal image and extinction can result. Certain visual impairments greatly increase the likelihood of such conditions existing, with extinction or fluctuation possibly resulting. Any eye condition which results in decreasing the sharpness of a contour makes conditions more condusive to extinction. When the retinal image is out of focus or blurred, its outlines are not sharp, and small eye movements are not as effective in maintaining an image. When this is combined with the diminution of the apparent contour, we come closer to a condition which may result in extinction.

Any eye condition which results in decreasing the apparent contrast of a contour does likewise. "The significance of the contrast sensitivity function may be expecially pertinent to the visually impaired individual. Bodis-Wollner has found that deficits associated with lesions of the visual cortex often do not manifest themselves under standard (high contrast) visual acuity testing procedures. However, visual acuity for low contrast targets differs markedly among normal and central neurological defect populations." (Workshop on Low Vision Mobility, 1976).

In 1970, Apple reported that the phenomenon of extinction "occurs with some frequency among low vision persons and it seems to be associated with photophobia, about which very little information is available." (Apple and Apple, 1970). This observation is in keeping with explanations suggested thus far in this paper, in that photophobic conditions would decrease apparent contrast. Also in conditions usually associated with photophobia such as cataracts, albinism, and achromatopsia, low visual acuity is also generally found.

Past theories of the role of eye movements have often surmised that evolutionarily, eye movements have served the function of preventing an image from stabilizing on the retina and resulting in extinction. If this theory were true, we would expect that onset of the formation of an empty field would stimulate the type of eye movement that would either preclude or prevent extinction from taking place. Such a position is no longer tenable since Cornsweet's (1956) study showing that "neither the frequency of saccades nor the size of drift samples correlated with the fading of stabilized targets." (Steinman et. al., 1973).

The functional implication of this is evident. Once someone has experienced extinction (or is about to experience extinction), there will be no response of eye movement automatically made to reestablish formation of the retinal image. In order to overcome extinction, the person must act to create the conditions or events necessary for the reestablishment of the retinal image. The practical method for creating these conditions is quite simple. It is based upon the second condition mentioned in this article for reestablishing a retinal image: abrupt contrast changes within a limited frequency range must occur. This can most easily be achieved by blinking enough times to regain the lost image. Apple and May (1970), Cornsweet (1969), and Yarbus (1967) all either suggest or imply such a method for regaining the retinal image. This is an easier method with more practical benefits than other methods such as rapid and distinct head movements. (Apple and May, 1970).

It would also serve one well to remember the converse application of this method as well; a person who blinds unusually frequently or who exhibits rapid and distinct head movements may well be experiencing extinction or fluctuation, without anyone else realizing it.

Since contour is an important feature in preventing visual extinction, as well as in reestablishing an image that has disappeared, it is obvious that distinctively contoured, high contrast backgrounds should facilitate visual functioning for someone who has a problem with fluctuation or extinction. Position in relation to such a background, or design of a background for specific uses, should take a person's acuity into account. For example, a one inch checkerboard pattern may be very effective for someone with poor visual acuity working at a very near distance, but may appear and function as a uniform background at a greater distance. For someone who would need to use this background at a variety of distances, a variety of sizes within the pattern might prove more worthwhile.

Finally, it is important to remember that extinction is not a simple process, and that only a few of the factors involved with extinction have been mentioned in this paper. There may quite likely be other causes involved. More than likely, a variety of factors will combine to produce the phenomenon. Retinal, neurological, perceptual, and environmental conditions are a few of the factors involved. There are undoubtedly more, and the reader should be cautious in assigning specific causes for an individual's experience of extinction.

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Low Vision Workshop (contined from page 5)

Institute for the Education of the Blind. By using the workshop format it is possible for the Mobility Center to expand on the training of orientation and mobility instructors without extending the time necessary for the basic course. It is hoped that the Low Vision Workshop becomes a standard element in the overall program in Marburg.

LOW VISION WORKSHOP FOR ORIENTATION AND MOBILITY INSTRUCTORS IN WEST GERMANY

By
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A low vision workshop for orientation and mobility instructors in West Germany was held at the German Institute for the Education of the Blind in Marburg, West Germany, from February 28 to March 3, 1977. In order to put the Low Vision Workshop into the proper perspective, one must be aware of the present status of orientation and mobility services in the Federal Republic of Germany. According to figures available from the Mobility Center of the German Institute for the Education of the Blind there are presently nine orientation and mobility instructors who have gone through the Center's course since 1974. (Four more start training in September 1977.) An additional six persons have attended the training course at the National Mobility Centre in Birmingham, U.K., two have been university trained in the U.S. and approximately 12 have attended short courses of six weeks or less. Of this diverse group of persons teaching orientation and mobility, only a very few had time during their training to formally concern themselves with the area of low vision. This number of instructors (irregardless of the question of qualification), the visually impaired population of 70,000 and the late appearance of long cane programs in the Federal Republic all add up to an urgent need for more teachers of orientation and mobility.

The Mobility Center of the German Institute for the Education of the Blind was created in an attempt to get more qualified teachers into the field. As in the case of many new programs, the difficulty seemed to be one of time and finances. It was possible, however, to initiate a three month course, which by its very nature must be quite intensive. This course is simply not long enough to cover the basics of orientation and mobility and the related coursework and still leave time enough for more than a brief introduction to the problems of low vision persons in mobility.

Knowing full well that exposure to methods for working with low vision persons is a prerequisite for a really qualified orientation and mobility instructor, the director of the Mobility Center, Mr. Jochen Fischer, in cooperation with the director of the Institute, Mr. Hans-Heinrich Schenk, scheduled a workshop as a follow-up for instructors who had previously completed the basic orientation and mobility course. This made it possible to expand on the brief introduction they had received during their training. The workshop was directed by the author.

Because of the work commitments of both the participants and the instructors it was necessary to conduct the 40 hour program in the course of one week, a fact that required a great deal of energy and dedication from the participants, particularly in regard to the many strenuous simulations.

During the workshop, experiences and problems were discussed. The theoretical discussions were supplemented with practical experience in the areas of clinical and functional evaluations, vision stimulation and training with and without aids. One segment on near vision aids and training was presented by Pamela Cory, Rehabilitation Teacher at the Institute, who coordinates the vision stimulation program and the CCTV program. Here, too, simulations were applied. It was also possible to observe and talk with low vision pupils of the Carl-Strehl-School at the Institute, in order to gain more insight into specific problems and their solutions.

Participants in the workshop came from the Christoffel Blindenmission, the Bavarian State School for the Blind, the Bad Liebenzell Mobility Department, the Saulgrub Rehabilitation Center for the Blind and the German

(continued on the bottom page 4)

03277-01

A Look at Commercial Goods and Their Uses as Low Vision Aids. LOWELL, Jan, Rehabilitation Teacher Program, Western Michigan University, July 1977, 13 p.

Low vision is commonly referred to as a multidisciplinary profession. And, like the disciplines comprising it, low vision often suffers from professional myopia. Quite often the professional feels that the only relevant ideas and equipment are those included in his own profession. Often, we think of low vision aids as consisting of only CCTVs, telescopes, prisms, high plus lenses and so on, even though a cursory examination of useful items would tend to dispel such a near-sighted notion. Lowell has helped to correct this professional myopia by examining local stores for items useful to the low vision individual, and by describing how these items can be used. For example, a stationery store produced clip boards, rub on letters, copy stands, copyholders, pens liquid correction ink for typewriters, index cards, paper cutters, mini files, labels, and many other items easily used by many low vision individuals. Some items, such as the clip board could be easily modified to improve its utility. In addition to the enumerations of items and their uses, Lowell concludes with a short check list which can be valuable in searching for other useful items. The check list includes thoughts on contrast, illumination, lettering, simplicity, economy, usefulness, need and safety. In short, the paper gives many useful clues about adapting readily available items to low vision use, and some guidance in finding your own useful low vision aids.

(G.L.G.)

03277-02

Parameters of Sucess in the Use of Fresnel Prism Lenses. GADBAW, P., FINN, W., DOLAN, M., & DE L'AUNE, W., Optical Journal and Review of Optometry, Dec. 1976.

While prisms and mirrors have long been reported as successful aids for individuals with extreme field restrictions, little has been reported on the parameters that define success or lack of success with these aids. The present report stems from a follow-up of 39 veterans fitted with Fresnel prisms at the Eastern Blind Rehabilitation Center (VAH, West Haven, Conn.) Among the factors contributing to successful acceptance of Fresnel prisms are: sudden onset and stability of field loss, formal lessons to enhance the subject's understanding and use of the prism, and allowing a lens area free of prism (rather than crowding the vision). The authors also report on their training techniques and factors which currently contraindicate the use of Fresnel prisms. This paper will be of interest to many readers working with low vision patients with field restrictions.

(G.L.G.)

03277-03

Peripheral Visual Acuity and Refractive Error: Evidence for "Two Visual Systems"? JOHNSON, Chris A., MILLODOT, Michel, & LAMONT, Anne, Perception and Psychophysics, 1976, 20(6)460-462.

Recent behavioral and physiological studies have suggested that visual information is processed in two distinct modes, with correspondingly different neural pathways: central field information being processed cortically and peripheral field information being processed subcortically. The distinction has given rise to the use of the descriptive term "what system" to describe the central visual system, and the term "where system" to describe the peripheral visual system. This study presents the results of two independent experiments, conducted in two laboratories using differing methodologies, which support the concept of two distinct visual systems.

In one experiment conducted at Penn State the testing procedure utilized a modified double-staircase method with test and background fields in a Maxwellian view. Trials consisted of brief exposures of horizontal sinusoidal gratings superimposed on a continuously presented background field. Acuity thresholds were determined in four observers at 0^{o}, 20^{o}, 40^{o}, and 60^{o} of eccentricity from the fovea along the horizontal meridian of the temporal field. Refractive errors were determined retinoscopically.

In the Montreal experiment projected Landolt rings were used in a method of constant stimuli to obtain acuity thresholds in three observers in successive 10° intervals (from 0° to 60°) along the horizontal meridian of the temporal field. Refractive errors were determined with an Arnulf retinofocometer.

Despite correction of peripheral refractive errors, both experiments yielded results showing a steeply sloped decrease in visual acuity from the center of the visual field to the periphery. This data did not differ from results obtained without correction of refractive errors. Since refractive error is known to significantly affect central visual acuity, the results support a two-system theory of visual information processing. To validate these results, two of the Penn State observers were tested at Montreal, the results confirming the original findings.

The analysis of visual properties using a two-system (rather than a unitary system) basis may provide a generally improved understanding of visual function. Within the area of low vision, the two-system theory is of particular importance in understanding the visual functioning of people with central visual field losses, and in particular, to the understanding of eccentric viewing.

(G.L.G.)

03277-04

Orientation and Mobility Project: A Low Vision Orientation and Mobility Evaluation. ENSOR, Scott Layne, Orientation and Mobility Program, University of Northern Colorado, December 1976, 23 p.

This is a rather large and thorough study whose author said it was his purpose to develop a standardized method of evaluating the functional use of low vision in travel situations and to blend the use of visual skills. The review of literature was carefully selected to match the purpose and included Dr. Natalie Barrega's work on visual functioning and the 1970 and 1975 Low Vision Mobility Workshop proceedings.

Some of the literature reviewed was for the purpose of identifying the unique needs of persons with low vision. There is also an interesting review of current literature which describes the functional implications of total or partial loss of use of peripheral visual system or total or partial loss of use of the central system.

The author lists what are considered important areas of skills: 1).the development of cognitive maps, 2). the ability to reach a destination, 3).the increasing sense of perceptual function.

There's an excellent set of guidelines for teaching the use of low vision aids in mobility with 12 basic principles. Ensor outlines what a task oriented evaluation should include: 1). Use of repeated field trials to assess overall performance, 2). Use of specific criteria exercises that sample the skills of the low vision student that enable him to operate effectively, 3). Use of assessment procedures tailored to the need of optometric and orientation and mobility speciality yielding data specifically attributable to visual functioning.

Ensor then proposes a rating scale and a list of 74 visual perceptual skills both of which are to be included in the low vision evaluation. The low vision evaluation itself is for both indoors and outdoors with and without low vision aids, and is in the form of a six page check list which applies the application of skills areas, rating schemes and guidelines described previously. There are 33 items for indoor evaluation and 41 for outdoor, and 33 for evaluation with use of low vision aids. This paper is an important contribution to the literature because of the content and the lucid way in which it is organized. Practitioners would find it extremely valuable and it would fit easily into program needs.

(L.E.A.)

03277-05

The Use of High Plus Reading Addition Lenses. LOUIS, Richard J. Orientation and Mobility Program., Western Michigan University, April 1976, 16p.

Louis summerizes some of the basic characteristics and caveats of high plus reading lenses ranging from plus 7.00 to plus 150.00. The program of instruction using high plus adds varies with each individual patient and the therapy should take the following considerations into account: motivation, psychological factors, historical data, medical history and visual history. The visual training sequence has three phases: office indoctrination, office use, and out-of-office use. Guidelines for the low vision specialist in developing training programs for plus lenses cover such aspects as routine, exercises, materials and training. Classroom teachers will find the suggestions and training techniques helpful.

(M.M.A.)

03277-06

The Physical Environment and the Visually Impaired: The Planning and Adaptation of Buildings and Other Forms of Physical Environment for Visually Impaired People. BRAF, Per-Gunnar (Project leader), ICTA Information Centre, Fack, S-161 03, Bromma 3, Sweden, March 1974 ($3) 34 p.

This monograph is the result of a project by the Swedish Institute for the Handicapped, translated into English. The aim of the study was to find out what demands people with impaired vision have regarding their immediate and peripheral environment. Primarily for architects and environmental planners, it was recognized from the outset that this would be useful for persons working with the visually impaired. With respect to them, the purpose was to inform about the existing problems in the physical environment,to give basic starting material for planning and design.

Information contained in the study was collected thru interviews and discussions with visually impaired persons and specialists involved in their rehabilitation and education, building engineers, industrial designers and other specialists. Its contents are arranged to present basic information first and to follow immediately with detailed information with a reference system between the two. It could be easily used as a handbook or manual in dealing with specific problems.

The five chapters contain information and discussions on the following areas: Implications of impaired vision; Basic and general problems such as obstacles, information, light, color and sound; specific environments are discussed such as living areas, bathrooms, public buildings, recreation areas, train and bus stations, and parks. Micro-environments are discussed: work areas, eating areas, toilet areas, stairs and elevators. The final section deals with lighting schemes and the design and placement of signs.

(L.E.A.)

03277-07

A Detailed Look at Expanding the Visual Field With a Reversed Monocular. DE BRUIN, Dale, Orientation and Mobility Program, Western Michigan University, August 1977, 41p.

The reversed monocular can be a forewarning to harzardous or dangerous incidents so that the proper protective techniques can be incorporated. It can relieve one from embarrassing situations and be useful in quickly and efficiently locating specific objectives. It must be decided whether a larger field or less distortion is more desirable. According to results found in this study, total average increase in field is about twice the poser of the reversed monocular used. Review of literature covers the basic optics involved in the reversed monocular, including "press-on" prisms. There is an extensive bibliography. The study utilized simulated field restrictions by means of straws of varied length, glued through the center of an occluder. Resultant fields were confirmed by testing with tangent screen. A table is provided to compare calculated results of what linear visual field should be at various degrees and distances as formulated by Gorski and Wilhelmus, and what those linear fields are at the same degrees and distances when looking through a reversed monocular. Recommendations are made for the proper use of the reversed monocular.

(M.M.A.)

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THE LOW VISION AWARD FOR GRADUATE EXCELLENCE

The following is a description of an awards program sponsored by the Low Vision Interest Group of the American Association of Workers for the Blind:

Purpose: The purpose of the Low Vision Award is to promote and recognize academic excellence relating to the field of low vision.

Qualifications: The award is open to any student, enrolled on a full-time basis, in graduate study at a college or university. The award is not limited to those enrolled in blind rehabilitation programs, but is rather, open to any student whose work directly relates to low vision research or clinical practice.

The Award: Those chosen to receive the award will present the results of their endeavor at the National Conference of the American Association of Workers for the Blind. In addition, the award carries a $250.00 honorarium.

Criteria for Selection: A national panel of experts will be established to review all entries and to select the final entry best meeting the following criteria:

a) The paper must directly relate to low vision research and/or clinical practice.
b) The paper must represent a unique contribution to the field of low vision.
c) If the paper is a research presentation, it must conform to current ethical standards and procedures, and must significantly advance current understanding of low vision, promote the application or development of low vision technology, or in some other maner directly promote the purpose and objectives of the field of low vision.
d) In general, papers reviewing current literature will not be considered, unless they provide an insight of unusual and compelling interest to the field.
e) Papers developing new clinical techniques must conform to current ethical standards and procedures and the clinical efficacy of the procedure must be demonstrated.

Submission of Papers: Initial submission of papers will be made to the Regional Program Coordinators, Interest Group #7, AAWB. Each Regional Coordinator will establish a regional panel for the purpose of reviewing papers submitted by students from colleges and universities within their region. The regional panel will select the best paper to be forwarded to the National Chairman-elect for submission to the national panel. The National panel will be a penel of experts selected by the Interest Group #7 Chairman and Chairman-elect.

Deadline for Submission: All papers should be submitted to Regional Coordinators at least 6 weeks prior to the Regional Conference or at a date established by the Regional Coordinator. All papers submitted for final consideration must be submitted to the Interest Group Chairman-elect at least two months prior to the date of the

National Convention.

Further information may be obtained by contacting Drs. Randy Jose or Greg Goodrich. Their addresses and those of the regional coordinators are listed elsewhere in this issue..

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COUNCIL OF CITIZENS WITH LOW VISION BEING ORGANIZED

The first membership-advocacy organization, predominantly made up of individuals with low vision is now in the early stages of organizing. The Council of Citizens With Low Vision is accepting memberships. The nationwide group will work at the local and national levels to help low vision people make maximum use of residual vision "through all necessary aids, services and technology".

The Council also will serve as a forum through which members and others can express their needs, preferences and interests. The new organization is an affiliate of the American Council of the Blind. A national meeting to formally constitute the low vision group will be held during the coming year, with the date and place to be announced soon.

Membership is open to low vision people, their immediate families and others with particular interest in working for the goals of the Council. Those wishing to join should contact Marvin F. Brotman, 22 Howard St., Newton, Mass. 02158 for application forms. Membership dues are $3.00 per year.

THE COUNCIL OF CITIZENS WITH LOW VISION is an advocacy membership organization, the purposes of which are:

1. To establish the right of people with low vision to make full use of their vision through all necessary aids, services and technology,
2. To provide a mechanism through which low vision people can express their individual interests, needs and preferences,
3. To educate the public, the professional, and low vision people themselves as to the capabilities, potentialities, and needs of such persons,
4. To establish outreach programs to ensure that all individuals with low vision have access to necessary services,
5. To promote needed research to prevent blindness and improve maximum utilization of sight,
6. To support the development of pre-service and in-service professional training programs to expand comprehensive low vision services throughout the country.

EDITORIAL -- AAWB SCORES COUP

The program planning committee of the American Association of Workers for the Blind scored a definite coup when it ok'd a low vision workshop on the Sunday prior to the National Convention in Portland this past July. Mary K. Bauman and her program planning committee listened with hesitency to the request of the Low Vision Interest Group to hold a workshop until it was agreed that the Orientation and Mobility and the Rehabilitation Teaching Groups would aid in it's planning and execution.

The workshop under chairmanship of Dr. Randall T. Jose drew over 135 persons and stimulated discussion during the remainder of the convention.

After that, what does AAWB and the Low Vision Interest Group do for encores after everyone finishes basking in the success of 1977? We have a few suggestions. If you don't like these suggestions, I can give you some others. But perhaps you could look at these first.

How about the Low Vision Interest Group jointly sponsoring a meeting with the Public Relations Interest Group? This would be a powerful team to deal with the problems of identity of individuals, programs, and agencies. Low vision individuals may well, and I am certain that they do, have strong feelings about their identification with blindness and sightedness. They certainly have preferences as to the way in which their visual impairment is portrayed to the public, and the way in which programs for the low vision individuals are identified makes a difference in the response to these programs. In some ways, the naming of a program shapes the attitudes which guides it. How long has it been, also, since the last agency in work for the blind agonized over its name and changed it so as to more nearly indicate that they did deal with the problems of persons with low vision? In terms of public education, there is the unanswered question: who are some major figures, heros, if you will, in low vision persons? Is Thurber the only one? I doubt it.

Now for suggestion No. 2: A workshop jointly sponsored by the Low Vision Interest Group and the Rehabilitation Counselors. I am sure that re--habilitation counselors have some specific treatment needs in mind when they send a client in for low vision services. What are they? Are they fulfilled? Do they contribute to the client's performance on the job? Conversely, what is a good work-up by a vocational rehabilitation counselor to allow for the best referral and services? What are the jobs that low vision persons have the most trouble with? This is to say, jobs involving motion, lighting differences, color. What visual conditions of the visual environment cause low vision persons the most difficulty on the job? What aids are seen by the counselor as needing development for use on the job? What portion of the counselor's caseload are low vision persons? What are the problems that they experience in adjustment? How helpful are their families in their vocational pursuits? What kind of testing procedures are used with low vision persons? What are the effects of advancing sight loss and employment counseling? Do affirmative action programs and non-discrimination laws cover low vision persons? How much would high quality low vision services, readily available to rehabilitation counselors, improve their effectiveness in counseling and job placement?

How about a workshop jointly sponsored by the Low Vision Interest Group and Administrators of Public and Private Agencies? How do administrators decide when they need to make program shifts to provide services to low vision persons? How can they survey needs in their own communities for low vision clinics? What are the costs of clinics and how are they organized and staffed? What are the effects of having clinics on other rehabilitation programs of the agency? What are the funding sources for initiating clinics and for on-going services? How do agencies serving adults make their facilities available to school children? Do low vision services detract from services for the totally blind?

I would travel to an AAWB conference in Timbuktu and pay my $10 to attend a low vision workshop on any of the subjects listed above. There is no argument that low vision cuts across many areas which are critical to the other interest groups and disciplines. The Low Vision Interest Group personified the rise of services to a vast population whose needs are specific and many.

So, AAWB we are proud of you and the interest groups that put together the workshop on low vision. It was healthy and was worth doing and we think it is worth continuing for 1979.

****

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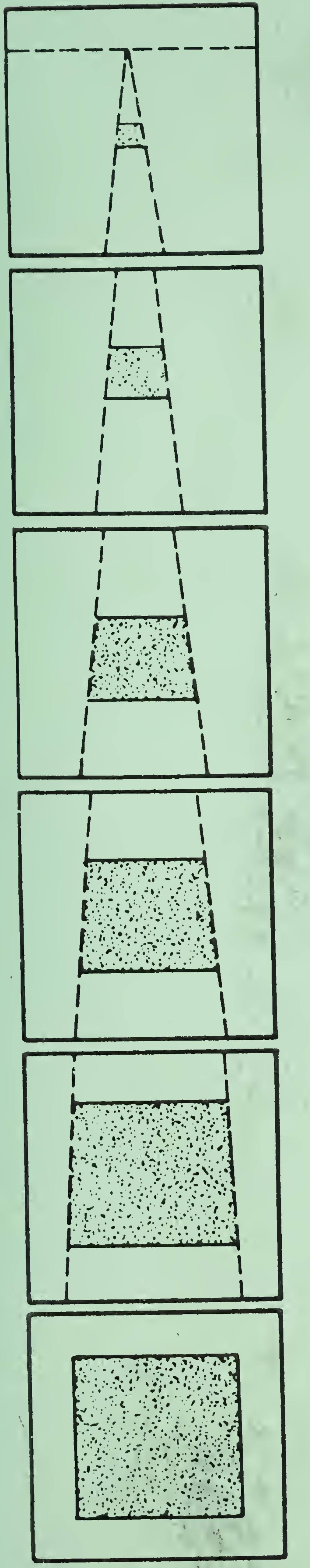
1977 AUTHOR INDEX

Vol. III No. 2&3

APPLE, LOYAL E. 3(1)21; 3(2)11
BROF, PER-GUNNAR 3(2)8
CORY, DENNIS 3(2)5
DE BRUIN, DALE 3(2)8
DE L'AUNE, W. 3(2)6
ENSOR, SCOTT LAYNE 3(2)7
FINN, W. 3(2)6
FREEMAN, PAUL B. 3(1)23
FROST, ALAN 3(1)22
GADBAW, P. 3(2)6
GOODRICH, GREGORY 3(1)22
JOHNSON, CHRIS A. 3(2)6
LAMONT, ANNE 3(2)6
LOUIS, RICHARD J. 3(2)8
LOWELL, JAN 3(2)6
LUDLAM, WILLIAM M. 3(1)1
MASSANARI, STEVEN K. 3(1)24
MAY, MARIANNE 3(1)19
MEHR, EDWIN 3(1)22
MILLODOT, MICHEL 3(2)6
MOORE, MARY W. 3(1)4
NATIONAL MOBILITY CENTRE 3(1)22
OPPEL, DEBRAH J. 3(1)4
PARKER, TERRY 3(1)13
PASCUZZI, DENISE H. 3(1)4
PIKOVSKY, ROSALIE 3(1)4
PSYCHOLOGY TODAY 3(1)24
QUILLMAN, ROBERT 3(1)22
SHAW, HELEN 3(1)22
WELCH, JAMES P. 3(2)1
WILEY, KENNETH 3(1)22
WILLIAMS, JOHN A. 3(1)4
WILSON, ROD 3(1)24

ISSN: 0362-4889



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LOW VISION ABSTRACTS promotes the information needs and skill growth within the areas of teaching the use of residual vision for low vision children or adults. When it began in 1971, the ABSTRACTS emphasized distance vision which drew the attention of orientation and mobility specialists. In 1976 the scope was broadened to include all areas of learning and phenomena which are related to low vision, both near and distance. This approach is designed to be of more use to the classroom teacher, the rehabilitation teacher and the rehabilitation counselor.

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LOW VISION ABSTRACTS

Spring 1978 Vol. IV No. 1

CONTENTS

FEATURE ARTICLES

Vision and its Influence on Development of the Visually Impaired Child
William V. Padula............1

Performance Measures and Success in Low Vision
Gregory L. Goodrich..........4

Peripheral Fixation as an Aid to Plotting Central Scotomas
Ron Utrup....................7

PROGRESS REPORT OF AMERICAN PRINTING HOUSE PROJECT PROGRAM TO DEVELOP EFFICIENCY IN VISUAL FUNCTIONING....10

ABSTRACTS

Vision and Reading (Perceptual-Motor)........................11

Increasing Reading Efficiency with an Optical Aid/Training Curriculum....................11

Orientation and Mobility for Multiply Handicapped Low Vision Children.......................11

Utilization of Telescopic Lenses in Low Vision Mobility.........12

Eccentric Viewing: A Case Report Report.........................12

The Effect Illumination and Color Combination Have on the Preferred Viewing Distance of Partially Sighted Adults................12

EDITORIAL -- NEW PARTNERSHIPS FOR SERVICE
Loyal E. Apple................14

CURRENT BIBLIOGRAPHY...............16

LVA COPY REFERENCE SERVICE..........19

COVER:

The illustration is of successive transformation of the image of a square of pavement while a person is walking along a street. It was sketched from a figure given by J.J. Gibson in The Perception of the Visual World. "A transformation is a regular and lawful event which leaves certain properties of the pattern invariant."

The motif of Low Vision Abstracts is TRANSFORMATION of mobility, rehabilitation, and classroom teaching through an increased understanding of the visual environment of the low vision person.

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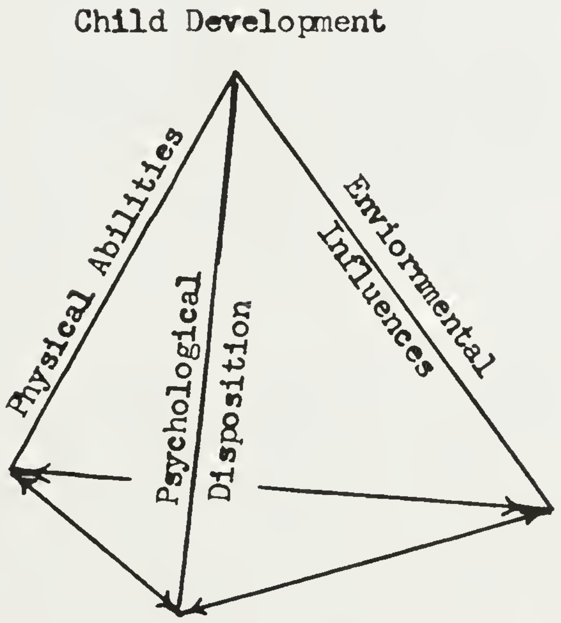
VISION AND ITS INFLUENCE ON DEVELOPMENT OF THE VISUALLY IMPAIRED CHILD

By
William V. Padula, O.D., F.G.I.C.D.*

Child development has been objectively investigated by science for over fifty years. Research by Gesell[1] and others[2] has documented that the development of the child can be monitored by the administration of developmental tests. This form of testing yields information concerning the developmental age of the child. The developmental age refers to the maturational level of the child in contrast to his chronological age (the time span elapsed from the date of his birth.

The research on child development has proven that not all children develop at the same rate and that their rate of development is influenced by several factors. The factors influencing child development can be represented by the concept of a pyramid as seen in Figure I.



Factors influencing child development.

Figure I

The edges or ages of the pyramid are anolagous to the physical abilities of the child, psychological disposition of the child, and the environment in which the child is nurtured. The physical abilities refer to metabolic, nutritional, and functional states of the child's body. The psychological factors represent the child's potential intellectual level and his emotional disposition. The environmental factors refer to the physical and cultural influences on the child. The interrelationship of these variables with each other are represented by the arrows on the base of the pyramid. Each of these variables influence the other variables. The interaction of these variables constructs a model of development that is in design unique for each child. This interaction is not a passive one for the child, but depends upon his active ability to continually probe and establish relationships between the three variables. As the child descerns these relationships, he can establish perceptual experiences. The perceptual experiences in turn enable the child to reprobe the three variables to develop new relationships and so continues the cycles of development.

The development of the child may be affected by a physical disability, low intelligence or environmental deprivation. When a child suffers a loss in any one of these areas, his development will depend on his ability to utilize the other variables to compensate for the loss. When the child is unable to compensate adequately, he will manifest a lag in his development.

For the sighted child, 80% of his learning experiences occur through his vision. Alluding to our previous discussion, this means that 80% of the child's ability to discern relationships and to establish perceptual experiences necessary for normal development occur through his vision. When a child has a visual loss, he must gain information from his environment through other means. However, he

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will not be able to be as discerning of relationships as the sighted child and in turn, will lack in perceptual experiences necessary for normal development. The relationship between the degree of visual loss and development, of course, is not one-to-one, but depends on the other variables described and their inter-relationship.

Since the visual sense has such a profound effect on the child's development, the child should be given every opportunity to learn through his vision. The majority of visually handicapped children can benefit from lens correction and optical aids such as telescopes and microscopes. Therefore, the low vision evaluation should be not only important for improving the child's visual acuity, but also for supporting his development. When a child is suspected of having a visual loss, he should be given a visual examination as soon as possible after birth. If lenses are necessary, continuous wear soft lenses can be prescribed during the first year of the child's life. By the age of three, a low vision evaluation should be performed to determine the abilities and needs of the child at that time, and also to predict and map out the child's future low vision needs.

While the presc ribed lenses and optical aids are important for improving visual acuity, they alone will not stop lags in the child's development. As have been described, developmental lags occur because of a variety of factors, and not solely because of a reduction of visual acuity. If this was the case, then all children with 20/20 visual acuity and healthy eyes would show "normal" development.

Lenses and optical aids prescribed for the visually handicapped child improve his central area of vision, thereby giving the visual system the ability to function at a higher demand level. However, as we have mentioned, the discrimination and learning process is not a passive one. Learning involves the active process of probing, investigating and understanding relationships. If the child is able to see clearly but does not understand the relationships of what he sees, then there is no learning. As Gibson has stated, "the visual world is an unlearned experience, that it is meaningless when seen for the first time, and that what one learns is to see the meaning of things."[3]

Along with the improvement in visual acuity, lenses and aids can also cause perceptual distortions to the visual space world. Optical aids such as telescopes and microscopes improve visual acuity because they utilize concepts of optical magnification. The magnification enlarges the object and also makes it appear closer than it is. While magnification yields information about detail, it also causes a spatial distortion. For the normally sighted individual looking at an object across the room, the object gives information about size, distance, and detail. The visually handicapped individual using a telescope sees a large magnified image of the object from which he can gain information about detail. However, the information about the actual size and distance of the object is false. The individual must look at the actual object to correctly interpret information about the latter.

If the individual can adapt quickly to changes in his visual world to gain information he requires, he will have a greater probability of being successful with the optical aid. The adaptation involves the ability to quickly screen and filter out certain information that is useless or erroneous. The child who is able to do this will be able to grasp "the meaning of things" with greater efficiency than the child who cannot. For the child who cannot adapt readily, the aid can actually interfere with his ability to learn visually. I do not mean to infer that the optical aid should be taken away from him because of this reason, rather that habilitation programs should be designed to affect his difficulties. These programs should utilize motor movement and multi-sensory input to reinforce the visual perceptual inadequacies. The purpose of these programs is to enable the child to transfer information from one modality to another in order to establish the perceptual experience. As the child begins to understand what he is seeing through this approach, he will in turn have more trust and confidence to use his vision. Ultimately, the goal is to have the child gain the information predominately through a visual approach rather than needed multi-sensory and motor reinforcement.

The visually handicapped child can also have functional vision problems that can interfere with his learning and development. This refers to difficulty in controlling pursuit tracking movements, difficulty in sustaining accommodation (focus), problems in convergence of the eyes, or an inability to quickly redirect the eyes from one point to another point such as in saccadic eye movements.

The child who has difficulty with contolling tracking movements will usually compensate for this by attempting to track with head movements. Because of the neurology of neck muscles controlling head movements, the positional adjustments are not as refined as adjustments that can be made by the eyes. Also, more energy must be expended when making a head movement as opposed to shifting the eyes. Therefore, the child will fatigue more quickly using head movements for tracking rather than eye movements.

Because the innervation to the focusing mechanism and the convergence mechanism is the same, children having difficulty converging their eyes usually have difficulty in sustaining focus. As they put more and more effort into maintaining this delicate balance of convergence and accommodation, they become fatigued and put less energy into the interpretive processes. In this way vision interferes with their learning.

The child who is monocular may not converge his eyes when looking at near range. The accommodation mechanism is aided by feedback from the convergence mechanism. Without convergence, the child must maintain accomodation without the proper motor reinforcement. Therefore, an unstable focusing system usually results.

Difficulty in controlling saccadic eye movements may be symptomatized by the child losing his place when transferring his eyes from the end of one line to another or by spatial disorientation when redirecting his gaze while looking around the room. The child may again compensate by using head movements.

Since our bodies operate on a closed energy system, when one modality requires greater control for operation, we will use more energy for this purpose consequently detracting from other areas. Because vision is our dominant sense, energy will be expended to allow the individual to operate visually so long as the person derives some form of meaningful information from the visual process. Therefore, by only improving visual acuity and not analyzing the visual process for possible causes of interference, the child may not function at his potential. In turn, visual interference may cause perceptual inadequacies leading to developmental lags.

The relationship of vision to development is profound. The science of optics has yielded great advances enabling the visually handicapped individual to be able to function at high visual demand levels. However, the improvements in visual acuity alone does not enable the individual to operate with maximum efficiency. For the visually handicapped child, the learning experience is greatly influenced by his use of his visual process. Our concerns for helping the child visually should not end with a low vision prescription to improve his acuity, but should begin at this point. If we expect the child to function within our visual world, we must attempt to understand the interactive process between his physical acilities, psychological disposition and his environmental influences. When we understand this better, we have begun to analyze the interferences and learning process of the child. We can then be effective in designing habilitation programs to help remove remaining interferences so that the child can function to his fullest potential.

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(continued next page)

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* * *

PERFORMANCE MEASURES AND SUCCESS IN LOW VISION

By
Gregory L. Goodrich, Ph.D.*

Success as a concept in low vision can have many contexts, and the contexts can represent a multitude of blessings or curses depending upon one's point of view. It is often argued that success in low vision care depends upon fitting the patient with the proper correction(s). The assumption being, that the correction will somehow (magically) improve the patient's visual functioning. While there is definite value in providing many low vision patients with optimum corrections, the above statement contains a fairly obvious fallacy. The fallacy is that the improved functioning is provided solely by the aid, and that the user is a passive recipient of the improvement. This is somewhat analogous to saying that providing a typewriter to everyone in the country will result in improved communications. Of course, some people will (if provided a typewriter) learn to type. Most people, however, will not and even if they didit is doubtful that the result would be improved communication. Typewriters and good communication are perhaps as unrelated as low vision aids and improved visual functioning. One may go with the other, but still not be related in any causal relationship.

Mehr and Fried[1] stated the concept in terms of the patient's proficiency. "One of the cardinal rules of successful low vision care is that a patient must never be allowed to take a low vision device home until he can demonstrate that he is proficient in its use."

In low vision it is often useful to measure proficiency in terms of pragmatic, quantitative events. Reading speed, reading duration and speed of locating objects are all examples of such events. However some degree of care must be used inselecting the measures so that they are suitable to the task. It is not advisable to measure reading speed as a criteria of performance in the use of a telescopic aid used for mobility. This is not because the aid cannot be used for reading (since it can be used to read street signs) but because the primary reason for using it is to locate landmarks and avoid obstacles and hazards. Thus, it is better to use measures of mobility

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(eg. time to complete a route, avoidance of obstacles, et.) since these are more clearly related to the purpose of the aid.

Proficiency measures are useful in many different contexts. First, they are indicators of an individual's performance levels at a given point in time. Second, they are useful in comparing performance levels across environmental conditions or between different aids. Third, they are useful in comparing one person's performance against another person's or against a hypothetical standard (as is done in measuring visual acuity). And fourth, they can be used as justification for prescribing (and purchasing) aids or for securing additional training.

The above list is probably not exhaustive of the uses of proficiency measures, but it is illustrative of the case that can be made for using such measures. There are many valid justifications for their use, and they can become quite seductive. If a person can only read 3 or 4 words per minute with a near vision aid it seems obvious that the aid should not be prescribed. If the patient cannot locate street signs with a telescope it should not be prescribed. If a patient's visual acuity is very poor then reading or distance aids should not be prescribed. These examples may all be true, but they may also be examples of the misuse of performance measures. If the patient has not received sufficient or proper training the performance measure(s) may be invalid. If the performance measure does not refer to a relevant activity it may be invalid. If the performance measure is applied too early (and in isolation of other factors) it may be invalid.

In examining some of our research at the Western Blind Rehabilitation Center, it became obvious that our performance measures could be easily misued. In one study[2] we examined increases in reading duration and speed over a ten day period of time. From this data we could easily draw learning curves, or figures, that indicated the rate of increase in reading speed with practice and training.

The data from one particular case is interesting. This subject initially read at 89 words per minute after about an hour's CCTV training. On the second day his reading speed had dropped to less than 85 words per minute. Our data on his optical aid performance indicated comparable reading speeds with an optical aid to his reading speed with the CCTV after two days of training. If a decision had been made at this point (between prescribing a CCTV or an optical aid) he probably would have been prescribed an optical aid. It gave similar performance, was less expensive, more easily maintained, and was portable. However, data taken later on in the course of training indicates this would have been a mistake. After ten days of training with the CCTV this subject had more than doubled his reading speed to over 190 words per minute. His performance with an optical aid did not come close to this speed, nor did it provide a similar reading duration.

The effective use of performance measures such as reading speed is predicated on the knowledge that a sufficient number of measures have been taken to yield a valid picture of the skill or knowledge being measured. It is also predicated on the knowledge that the measures used are sufficiently broad to provide a comprehensive measure of the skills being measured. Reading speed is a good measure of performance, but usually it is insufficient if employed in isolation of other measures. The obvious ex ample is that the value of any reading aid is small if it allows a high rate of reading, but is so difficult to use that the person's comprehension of the material read is low. Another example, also from our training data, are the cases where reading speeds on both CCTV and optical aid are comparable, but the person has only a limited reading duration with the optical aid. Our society places great value on written or printed material and an aid that only allows durations of 5 or 6 minutes may be inadequate for a person's needs. In such cases the single performance measure of reading speed is clearly inadequate.

A part of the seductiveness of performance measures is the ease with which they can usually be obtained, and this is also one of their strengths.

But to the extent that performance measures can be obtained for the wrong purpose they pose a hazard. As pointed out elsewhere[3] prescribing reading aids (or any aid) involves choosing an optimum aid from amongst many possible aids. Measures such as reading speed and duration can be useful in making the choice. But again, these can be insufficient if the patient's needs, uses for the aid, motivation, and related factors are not taken into consideration. A sample case is the person whose reading speed with a CCTV was much greater than with an optical aid and also the CCTV provided a significantly longer reading duration. These facts would indicate the advisability of prescribing a CCTV, except that the man was employed in a warehouse and his job required him to move from place to place comparing invoices to stock on hand. Given these conditions, a CCTV (even a "portable" one) would not have met the needs of his job, and so an optical aid was prescribed. To put it simply, a performance measure says nothing valid if it does not apply to the specific case at hand.

Summary

Success in low vision (as elsewhere) can be measured in a variety of ways; an individual's satisfaction, the ability to perform tasks that could not previously be performed, and through the use of performance measures, to mention a few. Most criteria of success are relatively straight-forward matters. Performance measures, because of their objectivity, ease of collection, and the ability they provide to compare levels of skill across time and between people and groups are particularly useful. However, it is because they are so useful that they are often misused. The instances of misuse include performance measures used as prescriptive criteria when only a single testing session is measured, or when testing occurs early in training before the patient has received adequate training and practice. Other instances occur when the performances measured to not relate to the reason for prescribing an aid, or when they are so limited as to not reflect the entire reason for prescribing an aid.

It is true that success in low vision is promoted by having the patient gain proficiency with an aid before it is prescribed, but the measures of proficiency are best utilized if they are applied with a clear understanding of their strengths and their limitations.

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PERIPHERAL FIXATION AS AN AID TO PLOTTING CENTRAL SCOTOMAS

By
Ron Utrup*

Introduction

This paper does not pretend to offer an improved method for charting central scotomas on a tangent screen. Its value will have to be determined by those with more experience than myself. I do propose, however, to present a theory of peripheral fixation that applies ideas and principles that I have gained during my low vision training at the Western Blind Rehabilitation Center.

Charting central scotomas presents a difficulty for the low vision examiner. The most common method is that of the tangent screen. The most crucial step in the plotting of central scotomas is fixating exactly on the center dot of the tangent screen and holding that fixation. If the fixation is not accurate and maintained, all plotted scotomas on the chart will at best be shifted and at worse be inconsistent and inaccurate. The nature of the central scotoma itself is the obvious problem. If it occludes the entire macular area, fixation can only be approximated by estimating the intersection of an "X" that is placed on the chart. If the center dot can be seen, but appears blurry, the eye is seeing the center dot with an area of the retina acute enough to distinguish it. This spot on the retina, however, cannot be the central macula (as would be needed to see the dot clearly and fixate correctly). The same problems are present in this case as are with a complete central scotoma. Because the image is blurred, the line of fixation is from an area off center of the macula, and therefore the fixation is not true (on line). Furthermore, the blurry nature of the image makes the incorrect line of fixation more difficult to maintain.

What is needed, then, is a method that would insure a proper and consistent fix ation on the tangent screen. This method will be explained later, but first it would be helpful to examine alternative methods of plotting central scotomas.

The bowl perimeter is often used for this purpose. The problems of fixing a gaze that were present for the tangent screen are present with the bowl perimeter. If the scotoma is complete, the fixation must be estimated, and if a partial scotoma exists that only allows an area close to the macula to fixate, the gaze will be off center and difficult to duplicate. These problems may be reduced, however, due to the apparatus on the device that aids the head to remain still. But there is a characteristic of the bowl perimeter that creates an even greater disadvantage: its size. Because the bowl perimeter requires the distance from the fixating place to the center dot to be short, the size of the field is small as compared to the tangent screen. Therefore, any movement of the eye from the fixation point will cover more degrees on the bowl perimeter than on the larger tangent screen, i.e., the plotting error is much greater on the bowl perimeter than on the tangent screen for the same amount of eye fluctuation.

Another method of charting central scotomas is the Amsler method. To begin with, it is limited to a 10° field from the central area (fovea) of the macula. Any scotoma extending beyond 10° will not be recorded on the Amsler charts. Secondly, the stringent conditions of the test itself are condusive to error. For ex ample, the distance from the fixating plane (the eye or lens of the corrective aid) must be maintained at 28-30 cms. Any movement forward or backward from these limitations will cause the test to be progressively inaccurate. The problem of increased error per distance that the eye moves off fixation as compared to similar movement on the tangent screen is present here as it was with the bowl perimeter. The closeness at which the test is done necessitates the chart to be small as compared to the tangent screen.

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*This paper was completed as part of the course work in the Rehabilitation Teacher's Program, Western Michigan University, Kalamazoo, Mich. Mr. Utrup's internship was at the Western Blind Rehabilitation Center, VAH, Palo Alto, Calif.

It is this smallness of the chart, as in the bowl perimeter, that creates this high error per eye fluctuation ratio of the Amsler tests. A further problem occurs when the patient is asked to describe and even point out his scotoma. There is a squared chart that aids this process, but even so, the accuracy of a person pointing out his own scotoma while trying to keep a fix ation is subject to question. It must be stated in fairness, however, that the Amsler charts were designed to detect eye disorders such as metamorphopia.

All of these tests have disadvantages. Even if the bowl perimeter could be enlarged to the size of the tangent screen, the fixation problems would still remain. Increasing the size of the Amsler chart would not solve the 10° limitation. In fact, it would simply be a cut-up version of the tangent screen. It seems apparent that the tangent screen, because of its size and therefore reduced error per eye fluctuation, would be the most accurate of the charts for plotting cnetral scotomas. The tangent screen, however, has the same fixation problems as the others.

The key to accuracy, then, is correct fixation. Not only does the tangent screen reduce error due to eye and head movement as compared with the bowl perimeter and the Amsler charts, but it also has the added advantage of a charted blind spot that is crucial in fixing a central gaze in the theory that follows.

Two factors are essential to the correct plotting of a central scotoma: 1) the fixation upon the central scotoma must be accurate and 2) that fixation must be able to be quickly and accurately checked against reference points.

If a significant portion of the blind spot remains, it can be used to set an accurate fixation on the tangent screen. A significant portion of the blind spot is defined as a large enough section of the blind sopt that is unaffected by scotoma that would allow the entire blind sopt to be charted. This is a subjective judgment, but it should be self-evident if there is enough blind sopt left for this purpose. After the blind spot is made to correspond to the one stitched on the tangent screen, a fixation can be held until the peripheral scotomas are charted. At this juncture markers can be placed in each quadrant at strategic points, thereby creating a cready reference for fixation and eliminating the need to adjust the eye to the corresponding blind spot each time the fixation needs to be checked.

Before discussing the particulars of this method, it would be helpful to introduce the eye disorders that would be condusive to this method. These would be eye disorders that involve central scotomas and, in some cases, associated scotomas that may interfere with the blind spot.

Macular Degeneration -- This disease causes decreased vision in the macular area only. The blind spot should be intact.

Retinal Detachment -- This disorder can result in any degree of loss of vision. If the rods and cones are allowed to lie against the pigment epithelium, sight will be restored. However, if the detachment (separation) has lasted for more than 24-48 hours, the macular vision will be lost. Retinal Detachment can also cause complicated cataract, which in turn can cause scotomas around the blind spot.

Embryonal Nuclear Cataract -- This is due to an injury during gestation and creates a small central area of opacification. This would be a pseudo-scotoma because it would not completely occlude vision at this point.

Senile Cataract -- This cataract can also occlude the central area of viewing.

Traumatic Cataract -- These can possible begin by central opacification of the lens and can further lead to glaucoma, which could cause associated scotoma near the optic head (blind spot).

Papilledema -- This causes edema of the macula and optic disc, which would create a scotoma near the blind spot.

Toxoplasmosis -- This often has a predelection for the macular area.

Diabetic Retinopathy -- This can cause retinal detachment of the macula, thereby causing a central scotoma. It can further cause secondary glaucoma, which would present the possiblity of an increased scotoma near the blind spot.

All of these eye disorders are good candidates for the peripheral fixation method of charting central scotomas, although the cataracts mentioned may create only an opacification that can be seen through. Further, the possibility of enlarged scotomas near the blind spot may make this method inoperable.

The first step in using the tangent screen for mapping the central scotoma is to determine if there is enough unaffected blind spot left to correspond with the one on the tangent screen (see figure 1) Because no accurate fixation is yet established, we must begin as usual by asking the patient to estimate where the "X" intersects. Now begin to map the blind spot. If it is evident from the disparity between the charted blind spot and the blind spot stitched on the tangent screen that the fixation is off, ask the patient to shift his or her gaze until the two blind spots correspond. If the blind spot being mapped is larger or smaller than that established on the screen, have the patient shift his eye until the blind spots are equidistant in their relationship (see figure 2). If the blind spots coincide in size, but do not overlap, the examiner can place the wand at the border of the tangent screen blind spot and have the student move his head in the appopriate direction until the wand appears or disappears. This will have to be done in many spots for the blind spots to match both vertically and horizontally.

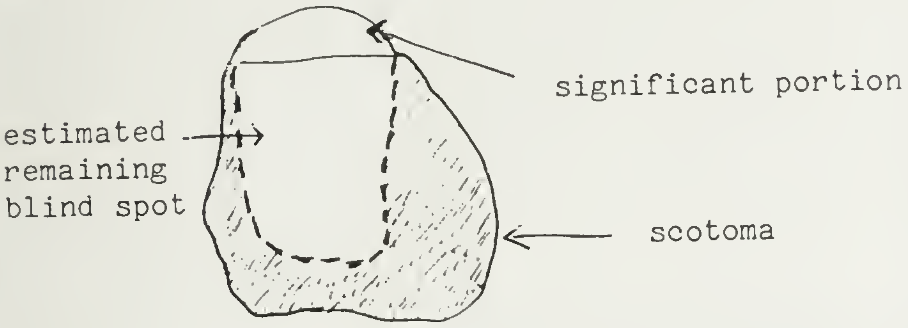

Figure 1

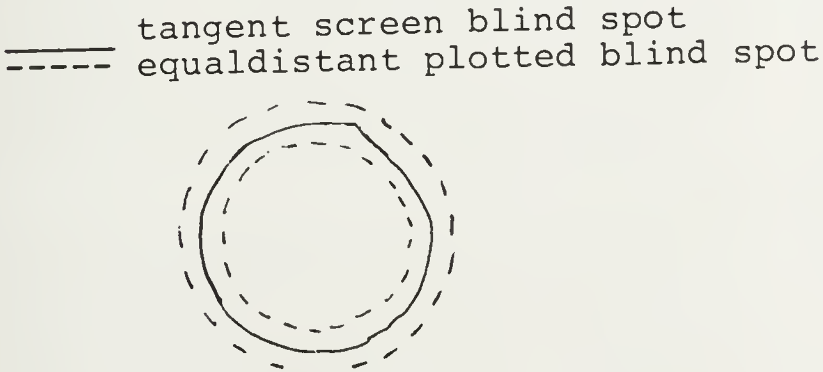

Figure 2

After the blind spot is correctly fixed, the central fixation upon the center dot should be accurate. Now the examiner proceeds to map out the peripheral scotomas (if any).

The next step is to place markers at one point in each quadrant where the visual field ends and the scotoma begins. There are a few considerations at this step that should be considered. First, the size of the markers should not be too large or too small. If they are too small, the peripheral fix ation of all markers will be too difficult to locate. If they are too large, the fixation will not be accurate enough. The color may have to be different from the wand so as not to confuse the patient. The shape of the wand is open to conjecture, but a dot may be most appropriate. Secondly, if the markers are placed too closely from one quadrant to another, it could be confusing. The ideal situation would be four quadrants with some remaining vision with the markers strategically placed so that any serious movement of the eyes would make one marker disappear. "Serious movement" will necessarily be defined by the size of the targets.(see figure 3). Thirdly, the placement of the markers is crucial. Two considerations are important -- placing the marker in a cul-de-sac (if available) and placing the marker as close to the macula as possible. If placed within a cul-de-sac, this would help prevent movement of the eye. This helps hold the fixation, for any movement would make it disappear. It is important to place the marker as close to the macula as possible for the retina becomes more able to discern images acutely as they approach the center or fovea area.

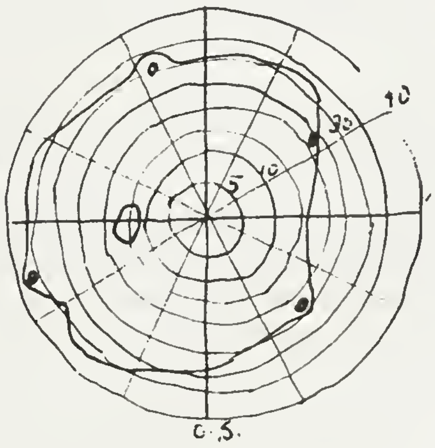

Figure 3

Now that the markers are set, the patient can constantly check his fixation: if he can see all markers with his peripheral vision, then he is fixating correctly. Now the central scotoma can be plotted and periodic checks can be made on the fix ation quickly and accurately.

In conclusion, this method allows central scotomas to be plotted more accurately on a large screen that minimizes errors due to its size. Although the references point (markers) are located in the periphery (and therefore not seen as acutely), they are located on the area of the screen where the area to degrees ratio is large, thereby compensating to an extent the accuracy lost due to any difficulty in seeing the marker images.

PROGRESS REPORT OF AMERICAN PRINTING HOUSE PROJECT PROGRAM TO DEVELOP EFFICIENCY IN VISUAL FUNCTIONING

Project Leader, Natalie Barraga
The University of Texas at Austin

The content and scope of the program has been defined by the Austin and American Printing House staffs, a rough draft completed, and reviewed by consultants from the field. Work has begun on revision of all components and plans are in progress to begin some formative evaluation of the Diagnostic Assessment Procedure by the Fall of 1978.

An entire afternoon at Council for Exceptional Children was devoted to discussion of the program, and information will be available also at the Association of Educators of the Visually Handicapped meetings.

Development, research, and evaluation of this magnitude takes time and a thorough evaluation of each portion is imperative before publication. Through such a meticulous process, the field is assured of a valid and reliable program useful for many years.

04178-01

Vision and Reading (Perceptual-Motor).
CHANDLER, Harry N., Special Education Program, Portland State University, August 1976, 16 pages plus bibliography.

The paper is a review of over a dozen journals in education, psychology, optometry and ophthalmology (published within 5 years of the review) concerning the effects of vision on reading. Several definitions of vision are explored and discussed in terms of their relevance to education, as are many papers dealing with perceptual-motor learning and the remediation of perceptual-motor deficits. Specific articles are critically presented in terms of their conclusions and limitations of the study.

After the fairly extensive review of the literature, the author concludes that "obviously, there is no one way to teach reading." While this is a relatively simple statement, one should not overlook the reasons behind the conclusion. Often a general educational theory will provide an excellent environment for most children (or adults), however, there may be some (including the visually handicapped) who will gain more from a specific educational theory. When these children are encountered, and the teacher must choose an alternative educational theory, the teacher will be faced with a miriad of possible choices. The acknowledgement that there are several viable alternatives can be helpful, particularly if the alternatives have received critical review.

Perhaps the largest fault of Chandler's paper is the extreme criticism with which he views the majority of the literature. While it is true that not all studies are properly controlled and that no one has done "the perfect study", it is also true that science progresses by successive approximations, each step improving the last, rather than by sudden leaps to perfection. Keeping this in mind, the paper should be a valuable aid to readers wishing to critically examine some of the recent literature on vision and reading.

(G.L.G.)

04178-02

Increasing Reading Efficiency with an Optical Aid/Training Curriculum.
JOSE, Randall T. & WATSON, Gale, Review of Optometry, 1978, 15(2)41-48.

With increasing frequency articles on low vision are recognizing both the interdisciplinary nature of the profession and the need to combine optimum selection of aids with an optimum training program in the use of the aids. This is particularly true of the work being carried out by Dr. Jose and his colleagues on increasing reading efficiency in children through the combined efforts of optometrist and educators. In this paper, the authors detail their training procedures and report on a number of cases. While the number of subjects (N=6) is small and does not permit a rigorous statistical analysis, their results do show a trend toward increased reading efficiency. In addition, the authors detail their lesson plan sequence.

The lesson plans are based upon the four developmental stages outlined by Barraga, however because of the age of the children, the specific lesson plans could not always adhere to Barraga's outline. Still, the lesson plan sequence is presented in detail and provides a useful sequence for application in other settings.

Among the authors' findings are an increase in minimum print size read by children and a possible increase in visual acuity. The authors also report that with moderate training and orientation to optical aids it is possible for classroom teachers to incorporate low vision training into the classroom routine.

(G.L.G.)

04178-03

Orientation and Mobility for Multiply Handicapped Low Vision Children.
HARLEY, Randall K., Professor of Spec. Ed., George Peabody College for Teachers, Nashville, Tennesse 37203.

The purpose of this project was to develop programmed instruction in visual orientation and mobility for multiply handicapped low vision children. A scale was constructed to identify skills needed for the development of a systematic program of instruction. The scale included 26 subscales grouped into the basic areas of motor development, concept development, visual skills and mobility skills. The scale was a criterion referenced instrument with items arranged in five developmentally sequenced sub-items. The programmed instruction was designed so that purpose, terminal objective, materials, activity objective and recording procedure was provided for each subscale. Each lesson was programmed in small sequential steps with directions to the teacher showing verbal instructions, demonstration and prompting procedures and reinforcement suggestions.

The programmed instruction was field tested in a 16 week period with 44 multiply handicapped low vision children divided into experimental and control groups. The results indicated significant overall gains in performance scores by the experimental subjects over the control subjects. The findings also indicated significant pre-post test gains in each of the four skill areas for the experimental group.

(Author)

04178-04

Utilization of Telescopic Lenses in Low Vision Mobility. QUILLMAN, R.D., Long Cane News, Nov. 1977, 10(2)3-9. (Originally presented July 19,1977 at the Biennial Convention, Amer. Assoc. of Workers for the Blind, Portland, Ore.)

The author initially presents a list of circumstances in which telescopes would be useful and concludes with an eight lesson training plan for low vision persons. He provides discussion of guidelines and problems in training with the telescope. It makes the telling point "skills that are learned in a clinical setting are valuable only when the client can transfer them to a"real" life situation". Techniques for developing eye-aid alignment are discussed and this appears to be a very valuable part of the paper. Tracking and scanning training are described and the lesson plans are given for a monocular training program.

(L.E.A.)

04178-05

Eccentric Viewing: A Case Report. QUILLMAN, R.Dee & GOODRICH, Gregory L., Long Cane News, Nov. 1977, 10(2)9-14.

Not only is a case study presented, but the authors furnish a discussion of eccentric viewing for some of the training techniques applied and the problems encountered. When there is damage to the central portion of the visual field, a new angle of viewing using a new portion of the retina is desirable. The portion of the usable retina nearest to the fovea is identified for training. A training program is described and the method for using the tachistoscope as a measure of performance. Training includes guided practice using a stand with bar on which practice letters are presented. The subject in the "case study" received benefits both in reading and mobility while obtaining measureable improvements on the tachistoscope. Data is presented for reading speeds without corrective lenses, with corrective lenses, and with closed circuit television.

(L.E.A.)

04178-06

The Effect Illumination and Color Combination Have on the Preferred Viewing Distance of Partially Sighted Adults. GERUSCHAT, Duane R., Orientation and Mobility Program, Western Michigan University, August 1976, 19p.

Does the low vision individual, given the opportunity to control illumination and preferred viewing distance, select significantly different distances for colored targets on colored backgrounds as compared to a black target on white background? Geruschat attempted to answer this question through use of three seperate tests: 1. variation in illumination 2. variation of target color 3. combinations of illumination and color contrasts. Review of literature on visibility factors (brightness contrast, brightness level, and type of light source) revealed that the varying results of past studies on legibility of color combinations was due to both lack of standardized color notation system and to proper control of lighting conditions. The author constructed a viewing apparatus consisting of an enclosed box with controlled illumination and a moveable viewing screen which can be manipulated by the subject to distances of 32" to 3.5" away from the subject. Illumination was measured by a photocell. Stimulus cards were printed with Snellen "E" and used Munsell paper and color system. The 6 test subjects were patients receiving low vision training at a VA rehab center. Subjects reported best focus and illumination levels and distances were recorded. Geruschat found his test results were invalid because of an erroneous assumption in the test design that the variables, color combination and illumination were seperated. He recommends future studies thoroughly test each variable seperately before combining the variables.

(M.M.A.)

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When we talk about low vision men and women, of whom are we speaking? Well, we are not talking about the 90 million Americans who are wearing ordinary spectacles today. We may be talking about some of the 10 million Americans who have an eye disorder such as night blindness, color blindness, or loss of an eye which would impair their visually guided behavior. We are talking about the 1.5 million Americans who at the advent of their sight loss are unable to read ordinary newsprint with spectacles. We are talking about the many thousands of Americans who are losing their jobs each year because they do not have the special lenses necessary to maintain their employment and we are talking about the many Americans who are unable to walk safely and to do many other tasks without special aids and rehabilitation.

An interdisciplinary approach to the treatment of blind and low vision patients should address itself to two highly significant issues for blind and low vision persons:

1. The right to make full use of vision through all necessary aids, services and techniques.
2. To receive recognition of capabilities, potentialities and needs.

These two issues were developed by a committee of low vision persons. Please note that they do not say we have a right to better medical care, or to better lenses, or to better jobs. Low vision persons consider themselves whole persons. Low vision persons are whole persons and would like that fact recognized in order that they may make "full use" of their vision.

One of the factors which has always confused the issue on treatment of low vision patients is the fact that it is an invisible disability in the experience of most persons. It certainly does not have the visibility of total blindness or paraplegia, or some of the other major crippling disorders, but is as devastating in many of the crucial areas of life: work, mobility, daily living, and reading.

Here are some concepts which may be of assistance in addressing some of the major aspects of the functional disability:

1.) Aids, services or techniques should "pay their own way" in terms of increased function.
2.) Low vision is a separate disability and low vision persons should not be encouraged to "pass" for either sighted or blind.
3.) Discrimination against low vision persons takes place both when they use aids and function well, and when they do not use aids and do not function well.
4.) Training and other attention to personal adjustment are crucial in the areas of dysfunction.

The increasing interest in the treatment of low vision patients, the greater clarity and identification of the need, and the direction of low vision persons themselves comprise a huge challenge to all disciplines involved in services to this group of citizens. Indeed, the opportunities for the success of an interdisciplinary appraoch are clearly fixed. I know of no other disability where such great improvements in function can be obtained by the major portion of the population using prescribed techniques for less cost than the disability of low vision. Measured in terms of return of function, comprehensive low vision services are highly cost-effective. Most clinics which use an interdisciplinary approach report a success rate of 90%, almost double the success rate for services without an interdisciplinary approach.

Historically, low vision persons have always used hand held magnifiers of various sorts to aid them in reading and performing tasks, but it was not until the 1940's that I find record of systematic attempts being made to collect and supply the American market optical aids of all sorts. Most of these aids were lenses used in industry which appeared useful to low vision persons. During the 1950's low vision clinics came into being in this country with the first ones being at the Industrial Home for the Blind in Brooklyn and the Lighthouse for the BLind in New York City, with as many as 34 low vision clinics demonstration projects being funded by the Federal government during the 1950's. The decade of the 60's brought increasing growth in the field. A survey by the National Society for the Prevention of Blindness indicated that there were 114 low vision clinics by 1969. In addition, the work of Dr. Natalie Barraga and follow-through programs by the U.S. Office of Education developed materials which enabled children diagnosed as totally blind to make full use of their residual vision. Dr.Barraga trained children to recogniz e the visual images that they were perceiving and this step opened the door to thousands of children and adults in this country. The 60's also saw the advent of better data collection through the model reporting area for blindness statistics under the National Eye Institute and the health survey which produced statistics on teh number of people who are unable to read newsprint with ordinary spectacles.

The 1970's have already produced additional advances. A recent AFB survey indicates that there are approximately 155 low vision clinics throughout the country. The N.Y. Lighthouse for the Blind has initiated a catalogue program which offers to prescribing specialists, 80 of the most prescribed and reliable low vision aids and devices. Closed circuit television magnification systems, developed through Rand Corp. and other private entrepeneurs, are greatly improving the ability of some low vision persons to read print and perform tasks. It stands as the most innovative and revolutionary concept in low vision technology. In addition, three professional organizations have emerged to provide forums in whic h low vision treatment can be discussed: the Clinical Society for Low Vision, which is a part of the AMA; the Low Vision Diplomate Section, which is a part of the AOA; and the Low Vision Interest Group, which is a part of the American Association of Workers for the Blind. The emergence of these organizations has been accompanied by a broadening interest among all disciplines in low vision. More recently, the National Eye Institute convened a workshop on the treatment of the low vision patient and indicated its interest in pursuing research in this area.

A new interdisciplinary partnership in low vision can and should address certain crucial issues which face us if low vision persons are going to be able to make "full use of vision".

1.) There needs to be a broader base of funding for low vision care. This low cost, highly effective care is not available under many federal programs or health insurance companies. Great portions of the low vision population cannot gain access or cannot afford access to low vision services.
2.) We need to do more of what we are doing today. Evolving a clearer concept of comprehensive low vision services.
3.) There is an increasing need for a system of uniform reporting and data collection on the effectiveness of various techniques, aids and comprehensive care programs.
4.) There needs to be a growth in the strength and vitality of professional organizations in the area of low vision.
5.) We need more high quality training programs in low vision for disciplines whose ordinary practice brings them in to the care of low vision persons.
6.) Because the most effective care of low vision patients is an interdisciplinary one, we need to agree that the subject area of low vision is "Holy Ground" and that we will make every effort to work effectively together for the development of services. This means that in ordinary interdisciplinary elbowing and pushing and pulling we will lay aside ordinary approaches and weapons when entering "Holy Ground" and that the concept of "hot pursuit" does not apply when one is dealing in the area of low vision.

There is a large population of low vision persons in this country. They have unique needs which we are able to recognize and which we are able to treat. These needs are not now being fully met by the service delivery, rehabilitation or education systems. We know the treatment of choice. Let us therefore forge the necessary partnerships to serve this unique group.

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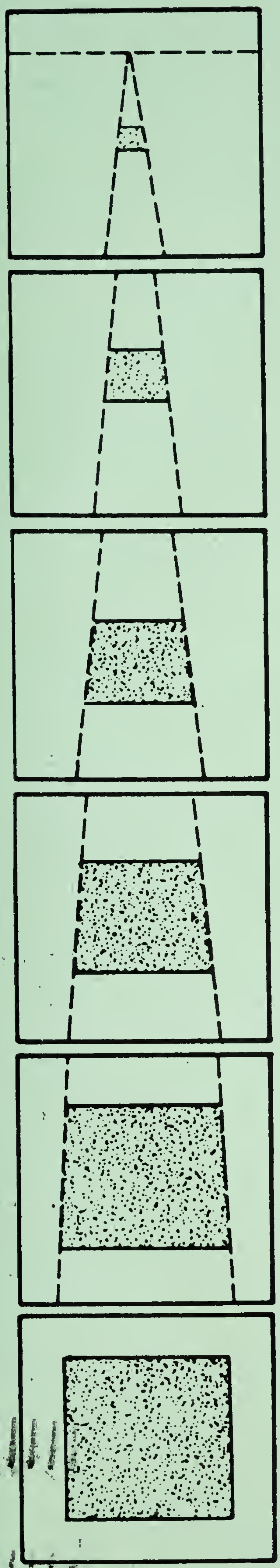

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LOW VISION ABSTRACTS promotes the information needs and skill growth within the areas of teaching the use of residual vision for low vision children or adults. When it began in 1971, the ABSTRACTS emphasized distance vision which drew the attention of orientation and mobility specialists. In 1976 the scope was broadened to include all areas of learning and phenomena which are related to low vision, both near and distance. This approach is designed to be of more use to the classroom teacher, the rehabilitation teacher and the rehabilitation counselor.

LOW VISION ABSTRACTS contains feature articles which deal with either research or practice, abstracts of student papers or literature in the field, bibliographies and suggested research topics. The ABSTRACTS does not deal with optical aids as such, or pathology as such, since both these areas have their own well-developed literature.

LOW VISION ABSTRACTS is supported by students and faculty in both graduate and undergraduate programs of teacher preparation in the areas of blindness and visual impairment. Assistance to, and stimulation of work at this level is the basic commitment of the ABSTRACTS.

Please direct all correspondence pertaining to submission of original manuscripts and other material for publication in LOW VISION ABSTRACTS to Gregory L. Goodrich, Western Blind Rehab Center (126B), V.A. Hospital, 3801 Miranda Ave., Palo Alto,Ca., U.S.A. Please report any change of address.

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CONTENTS

FEATURE ARTICLES

Typoscopes and Yellow Filters for Cataract Patients
I. Bailey, K. Kelty, G. Pittler, T. Raasch, and G. Roberts......2

Visual Training for the Severely Visually Impaired: Implications of Research Findings to Applied Situations
Olga Overbury and Michael Bross..................7

Low Vision in the "Down Under"
Dee Quillman..................10

REASEARCH GRANT APPLICATIONS RELATIVE TO THE MANAGEMENT OF SEVERE VISUAL IMPAIRMENT SOUGHT BY THE NATIONAL EYE INSTITUTE..............................11

EDITORIAL -- NEW EDITOR AND PUBLISHER EXPECTED
Loyal E. Apple and Marianne Apple.1

ABSTRACTS

Dominican Visual Preference Record..........................14

Preliminaries in a Theory of Practice with Low Vision Children and Youth.......................14

Low Vision Lesson Plans for Illinois Visually Handicapped Institute........................15

CURRENT BIBLIOGRAPHY..................17

DIRECTORY OF LOW VISION SERVICES NOW AVAILABLE........................20

LVA COPY REFERENCE SERVICE............21

COVER:

The illustration is of successive trnasformation of the image of a square of pavement while a person is walking along a street. It was sketched from a figure given by J.J. Gibson in The Perception of the Visual World. "A transformation is a regular and lawful event which leaves certain properties of the pattern invariant."

The motif of Low Vision Abstracts is TRANSFORMATION of mobility, rehabilitation, and classroom teaching through an increased understanding of the visual environment of the low vision person.

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EDITORIAL

New Editor and Publisher Expected

After eight years of innovative publication, Low Vision Abstracts will be under new management in 1979. Gregory L. Goodrich, Ph.D., Associate Editor, will assume control of the journal as Editor and Publisher. This is a highly desireable turn of events. Dr. Goodrich has outstanding leadership qualifications with background in vision science and close ties to both the clinical and academic communities in low vision. He is currently associated with the Western Blind Rehabilitation Center, Veterans Administration Hospital, Palo Alto, California, as a research psychologist.

Contributing editors will be contacted by Dr. Goodrich in the near future to discuss any new thrusts or programs he may have in mind for the journal. Both the LVA Copy Reference Service and the purchase of back issues will remain available.

The past eight years have been extremely rewarding and productive for the Low Vision Abstracts.Fourteen issues have been produced to date. In 1975 the Abstracts was expanded to not only emphasize low vision problems relating to mobility, but also low vision problems relating to teaching the use of residual vision for near vision. The Low Vision Abstracts has reported on the increasing pace of activities and the deepening interest in low vision as it became a more important part of the curriculum for the preparation of specialists working with the blind and visually handicapped. Events and scholarship in low vision have received the attention of professionals in other countries. Low Vision Abstracts is mailed to subscribers in Australia, Canada, England, Ireland, Israel, Japan, The Netherlands, South Africa, Soviet Union, Sweden, United States, New Zealand, and West Germany.

In addition to some fantastic and some not so fantastic editorials, the Abstracts has provided information to the field which would otherwise have languished in the university training program files. There were some things we enjoyed the opportunity to publish: a survey of low vision clinics regarding training and employment of low vision specialists; assessment forms developed by mobility specialists across the country; application of low vision aids to ADL; a survey of orientation and mobility low vision training trends and needs; psychophysical considerations for vision training; and the use of vision reduction equipment in teacher preparation and training programs.

We are grateful to our colleagues for the encouragement and support which they have given to the Low Vision Abstracts. We will now join the ranks of contributing editors and do our part to keep the Abstracts lively and informative as it reports on the growth of knowledge about low vision internationally.

L. E. Apple
Marianne May Apple

TYPOSCOPES AND YELLOW FILTERS FOR CATARACT PATIENTS

By
I. Bailey O.D. M.S.*
K. Kelty O.D.*
G. Pittler O.D.*
T. Raasch O.D.*
G. Roberts O.D.*

Even though it is often pretended otherwise, low vision clinicians do not have a sound understanding of all of the aids they prescribe to assist the vision of low vision patients. The majority of aids prescribed are magnifiers, and low vision clinicians, by and large, do have a soundly based rationale and a systematic approach for the prescribing of magnifying devices. Two aids of which we do have an inadequate understanding are yellow filters and typoscopes. Enthusiasm about these aids varies enormously from clinician to clinician. As yet, there has been no clear identification of the visual or ocular characteristics of the patients who are most likely to benefit from the use of these aids. Nor has there been any sound rationale advances to explain why these aids benefit patients. In fact, even the nature of the benefits has not been established. The literature does not tell us with any certainty whether typoscopes and yellow filters improve acuity, increase reading speed, increase contrast or increase comfort.

In this paper we describe two projects, one related to typoscopes performed by Keltz, Pittler, and Bailey(1977) and the second project related to yellow filters (Raasch, Roberts, and Bailey (1978).

The Typoscope

The typoscope was first described by Prentice (1907) in 1897 and it consists of a matte black card with a cut out rectangular aperture about 10 cm long and 1 cm high. The typoscope is intended to improve reading vision. The typoscope is held against the page and the words of immediate interest viewed through the rectangular opening. Prentice (1968) and others (Fonda, 1950; Stimson, 1957) suggest that the typoscope increases the contrast of the print by reducing the amount of light entering the eye from the area surrounding the print being read. It is suggested that that cataract patients who are subject to light sc atter in the eye will receive benefit from the typoscope. Prentice (1907) suggests, and the personal experience reported by Leinback (1960) indicates that the typoscope can give improvements of reading acuity.

Yellow Filters

Yellow filters can be used for either distance or near vision. The yellow filter can be in the form of a tinted spectacle lens, a clip-on attachment to spectacles, a sheet overlaying reading material or a filter in front of the source of illumination. Yellow lenses have long been advocated for improving vision in hazy or overcast conditions and while subjective impressions suggest that this improvement is real (Kislin et. al, 1978; Ross, 1950), improvement in performance has not been quantified. Yellow filters have been used for night driving but Richards (1964) finds they produce either no change or a decrease in acuity rather than an improvement. Allen (1964) suggests that yellow light might assist persons with vitreous or lenticular degenerations which might produce a "blue fog" by the preferential scattering of short wavelength light.

Faye (1970) and Mehr and Freid (1975) acknowledge that yellow or other special filters can help low vision patients. The most plausible explanation yet offered for improvements in vision with yellow filters is that by selectively filtering out the short wavelength, yellow filters

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reduce the possibility of veiling glare cause by intra-ocular scatter. Cataract patients might therefore be expected to derive most benefit from yellow filters.

Testing Visual Performance

For the typoscope and the yellow filter experiments essentially the same procedures were used. The experiments were conducted on subjects (a) who had cataracts and (b) who had normal vision but had cataracts "simulated" by using frosted glass. The objective was to test reading acuity and reading speed as the subjects were tested under the various conditions. The reading test charts were designed by Bailey and Lovie (in press). These charts were made up of groups of unrelated words of short, medium and long length (4,7 and 10 letters). Except for the very large sizes, there are 6 words at each size level. The spacing is compact so as to simulate normal reading material. The size of the print ranges from 80 to 2 point, there being 17 size levels with each size step equal to 0.1 log unit (a ration of approximately 5/4). These charts were made as transparencies and they were viewed against an opal plexiglass screen transilluminated by carefully controlled incandescent lamps. The patients read aloud and the time taken to complete each group of 6 words was recorded. To avoid memorization, we used 20 charts having the same design features but containing different words.

The Typoscope Trials

It appeared that the typoscope might produce improved performance either because it altered contrast or because it acted as a line guide to help with keeping the place when reading or because it removed some distracting detail from the surround. The following test conditions were created: (a) positive contrast charts (black print on white) with no typoscope, (b) negative contrast (white print on black) charts with no typoscope, (c) black typoscope over positive contrast print (2 luminance levels), (d) black typoscope with negative contrast chart (e) white typoscope, positive chart (f) white typoscope, negative chart (g) lineguide (line drawing of a rectangular frame on clear celluloid), positive chart (h) lineguide, negative chart. The luminance of the white regions of the test charts was 350 cd/m^2 except for the one low luminance condition for the black typoscope with positive contrast print. Care was taken to standardize the reading distance, the instructions and the practice experience for each subject. The order in which the various conditions wer presented was arranged to enable the identification and correction of any practice effects. There were 8 subjects with cataract and 10 subjects in the group with simulated cataract.

Results of the Typoscope Trials

In our analysis of the results, part of which is presented here, visual acuity scores were expressed as the logarithm of the minimum angle of resolution (log MAR) because this enables increases or decreases to be expressed as quantities which represent the proportion of the change in the minimum angle of resolution. (To illustrate this, improvement from 20/200 to 20/160 or 20/50 to 20/40 both would be recorded as a change of -0.1 log units; in both instances the MAR decreases by the same ration 5/4.) For the presentation of results in table 1, the mean individual log MAR values for each of the 10 conditions has been converted to the more familiar Snellen fraction.

For the cataract group it is seen that all typoscope conditions improved reading acuity. For those situations in which there was a reduction of light entering the eye either using black typoscopes or reversed contrast charts, there was between 0.07 and 0.10 log units of change (this is equivalent to 3/4 to 1 line improvement on most acuity charts). The acuity improvement was smaller (about 0.05 log units) when the white typoscope or the line guide was used on positive contrast charts.

For the group of subjects wearing frosted lenses, the results were similar in nature but more striking in magnitude. All of the isolating typoscope arrangements improved average acuity by between 0.10 to 0.35 log units. (This is equivalent to about 1 to 3 1/2 lines on most charts.) It is interesting to note that the larger improvements occurred in those situations which created lowest levels of total light flux to the eye. This was when contrast was negative, or when the black typoscope was used in the lower luminance condition (Pos II).

TABLE 1

EFFECTS OF TYPOSCOPES ON READING ACUITY AND SPEED FOR CATARACT PATIENTS AND SUBJECTS WITH SIMULATED CATARACT

		CATARACT PATIENTS N=8			NORMALS WITH FROSTED LENS N=10		
Standard Condition No Typoscope Positive Contrast		Mean Acuity 20/50		Mean Time/Row 5.26 sec	Mean Acuity 20/89		Mean Time/Row 5.08 sec
Typoscope	Contrast	Av. V.A.	(Change in log units)	Av. Time/Row (sec)	Av. V.A.	(Change in log units)	Av. Time/Row (sec)
Black	Pos	20/44	(-0.10)	6.24	20/71	(-0.10)	4.27
Black	Pos II	20/46	(-0.07)	5.85	20/46	(-0.29)	4.92
Black	Neg	20/46	(-0.08)	8.02	20/40	(-0.35)	4.96
White	Pos	20/49	(-0.05)	6.31	20/70	(-0.10)	4.40
White	Neg	20/46	(-0.08)	6.69	20/44	(-0.31)	4.72
Line Guide	Pos	20/49	(-0.05)	5.38	20/90	(0.00)	5.02
Line Guide	Neg	20/44	(-0.09)	6.87	20/45	(-0.29)	4.95
None	Neg	20/45	(-0.09)	5.37	20/46	(-0.29)	4.92

Regarding the speed of reading all typoscope arrangements caused the cataract patients to take more time with their reading whereas the frosted lens group read more rapidly when using any line guide. Perhaps this difference was due to differences in age, dexterity and reading habits of the two groups. The cataract group came from a clinic population and all were over 50 years wile the frosted lens group were all optometry students in their twenties.

It seems possible that with more practice, the cataract group might have shown no change or even a marginal improvement in their speed of reading.

The Yellow Filter Trials

There were 6 different yellow filters used for these tests. There were two Roscolene (#805 and #806) theatrical lighting filter sheets which were placed as overlays on the transilluminated charts. A yellow trial case lens of unidentified origin and a Kodak Wratten filter #21 were placed in Halberg Clips which were mounted over spectacle lenses and the NOIR glasses and the amber slip-in filters were also used over spectacles. The amber slip-in were not available at the time of the trials with the frosted lens group. The luminance of the white regions of the test charts was 350 cd/m^2. For each subject the usually preferred eye was tested while the other eye was occluded. There were 9 subjects in both the cataract group and the frosted lens group. Trials were also conducted with three neutral density filters of densities 0.1, 0.3 and 1.0 N.D. Interpolation of the results with neutral filters allowed the performance with the various yellow filters to be compared with the performance expected with a neutral filter of equivalent mean luminance transmittance. This permitted a separation of the effects of selective chromatic filtering effects and the simple overall darkening effects which are created by the yellow filters.

Result of the Yellow Filter Trials

The results are summarized in table 2. Inspection of table 2 shows

TABLE 2

EFFECTS OF YELLOW FILTERS ON READING ACUITY AND SPEED FOR CATARACT PATIENTS AND SUBJECTS WITH SIMULATED CATARACT

	CATARACT PATIENTS N = 9			NORMALS WITH FROSTED LENSES N = 9		
Standard Condition	Mean V.A. 20/57		Mean Time/ Row 5.24 secs	Mean V.A. 20/99		Mean Time/ Row 4.81 sec
	Av. V.A.	(Change in log units)	Av. Time/ Row (sec)	Av. V.A.	(Change in log units)	Av. Time/ Row (sec)
Roscolene 805	50/55	(-0.02)	5.65	20/106	(0.03)	4.62
Roscolene 806	20/58	(0.01)	5.42	20/114	(0.06)	4.91
Trial Case Lens	20/60	(0.02)	5.46	20/111	(0.05)	4.73
Kodak #21	20/59	(0.01)	5.28	20/115	(0.06)	5.11
Noir	20/70	(0.09)	5.87	20/129	(0.11)	4.47
Amber Slip in	20/57	(0.00)	6.04	------------		--

that for the cataract subject yellow filters in general tend to reduce acuity but the magnitude of the reduction is very small. For all but the NOIR glasses these reductions in acuity were not statistically significant. For the frosted lens group the average acuity reductions were larger in magnitude and for 3 Of the 5 filters tested the reduction was significant at the 95% confidence level. For the frosted lens group, the yellow filters again caused a decrease in visual acuity, and this decrease was statistically significant at a 95% level of confidence for 4 of the 5 filters. Again the greatest magnitude decrease occured with the NOIR lenses.

For the trials conducted with the 0.1, 0.3 and 1.0 N.D. neutral filters there were also reductions in acuity. For the cataract group these filters reduced acuity by 0.00, 0.03 and 0.06 log units respectively and for the frosted lens group the average reductions were 0.03, 0.05 and 0.12 log units. By comparing the acuity reduction created by each of the yellow filters to the acuity loss predicted for a neutral filter of the same mean luminance transmission, it was found that all of the acuity losses associated with the yellow lenses could be explained by the reduction in luminance they produced. Regarding the speed of reading it appears that for these subjects the yellow lenses caused no changes of any consequence. It might be noticed that the NOIR glasses and the amber slip-ons produced slower reading for the cataract group and the NOIR glasses gave faster reading times for the frosted lens group. These effects are probably artifacts resulting from the necessity for the subjects to hold or to support these appliances during the trials. It appears that this task was somewhat distracting to the older cataract group of subjects and for the frosted lens group which was younger this task appears to have provoked some impatience which led to faster reading.

Discussion

From these studies it is reasonable to suggest that patients with real or simulated cataract are likely to be helped by the use of a standard typoscope. The major effect is an increase in acuity which in our sample was in the order of about 1 line on a Snellen Chart (0.1 log units). If there is any improvement at all in reading speed it is marginal. The yellow filters in these trials produced no significant improvements in vision. On the contrary, the yellow filters appeared to marginally reduce acuity due to their darkening effect. These conclusions can be drawn by analyzing the pooled or average data from the different groups of subjects which has been presented here. Although the data for the individual subjects have not been shown here, studying the data from each individual would have resulted in the same general conclusions. Within our limited samples, there was no one subject who showed any outstanding or dramatically different improvement in performance either with the yellow filters or with the typoscopes.

From our experiments it seems reasonable to recommend that clinicians evaluate the effect of black typoscopes on all low vision patients with significant cataracts. Some improvement in acuity can be expected. Our results suggest that yellow filters should not be expected to improve reading performance of low vision patients with cataract. However, it cannot be concluded that yellow filters will not be of significant benefit to some cataract patients or to patients with different vision disorders.

To date the literature contains no documentation of quantifiable improvements in vision resulting from the use of yellow filters by low vision patients. If yellow filters are of significant assistance to low vision patients there is a need to identify what the benefits are, and which patient groups experience benefit and a sound rationale to explain their effect should be sought.

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VISUAL TRAINING FOR THE SEVERELY VISUALLY IMPAIRED: IMPLICATIONS OF RESEARCH FINDINGS TO APPLIED SITUATIONS*

By
Olga Overbury** and Michael Bross

Over the past two decades, a shift in emphasis has taken place in visual rehabilitation programs from the use of other senses as auxilliary channels to the concentration of the individual's efforts on utilization of residual visual capacities. Only recently have specific strategies for optimal use of residual vision been experimentally tested and validated, and these have yet to be implemented in active programs of rehabilitation (Barraga, collins & Hollis, 1977; Goodrich & Quillman, 1977; Overbury & Bross, 1978).

The first seminal results to show the possibility of improvement of visual skills in the area of reading acquisition were reported by Frostig (1972) and Bieger (1974). These authors independently examined the effectiveness of visual perceptual training on reading skills. They reported that normally sighted second and third grade non-readers, given visual training, improved significantly in visual perception. Improvement was measured by tests of figure-ground discrimination, perceptual constancy, and spatial relations. The training seemed to have little effect on the children's reading achievement. Similar results had been reported in an earlier study by Rosen (1966) in which normally sighted first grade children showed considerable enhancement of trained perceptual capabilities. These findings indicate that if the visual practice and training utilized in the above mentioned residual vision studies did not produce a sharper image image, the subjects may still improve their performance due to a learned ability to better interpret a blurred image by filling in the missing information. This explanation is a natural derivation of Gibson's (1963) redefinition of the senses from "mere receptors" i.e., receivers and transducers of energy, to systems for exploring, searching, and selecting ambient energy.

If one thinks in terms of exploratory vision, then even when there is extensive neural damage to the system, there still exists the possibility of interpreting a visual pattern based on such a search process. A parallel process exists in the tactual modality, where extensive search by touching an object and noting more details allows a perceiver to recognize a stimulus which at first seems ambiguous or "fuzzy". An important question in the case of the exploratory use of vision concerns the type of search process employed where selection of particular strategies will depend on the demands of a given visual situation or task. For example, in one instance, the perceiver may inspect the visual field and selectively seek a physical target for fixation in an array of visual targets. In another situation, the perceiver may choose to search the retinal image for the required information.

Two recent studies have concentrated on specific strategies with which the low vision subject could operate. Goodrich and Quillman (1977) emphasized the use of the optimal retinal area and demonstrated four techniques for eccentric viewing training. These training methods teach patients with central scotoma to locate targets, hold a fixation, and practice visual tracking while, at the same time, overcoming the central fixation reflex. Overbury and Bross (1978), on the other hand, ex amined the potential of specific training in the analysis of visual information to imporve acuity performance. The results of the first two experiments in their study demonstrated that performance on the visual tasks

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of resolution, measured on a Landolt Ring Chart, and on vernier alignment can be improved with extensive visual work. In both experiments, the individuals in three experimental conditions: "practice", "practice with feedback", and "practice with feedback and instructions", produced significantly higher acuity scores at the end of the twenty minute testing session than they had at the beginning of the period. In contrast to this, subjects in a control condition who had no opportunity for "visual work" during the same time span showed no appreciable change in their performance.

It has been previously suggested that any instructions or technique suggestions offered by a researcher, or for that matter, by a rehabilitation worker, may be redundant or inferior to the low vision person's self-acquired strategy system. It appears, however, that even though these individuals may be aware of appropriate visual strategies, they do not seem to use them automatically in all situations. This suggests that research should concentrate on guiding and improving the individual's preferred viewing strategies rather than imposing a new set of techniques for visual analysis.

The findings of Goodrich and Quillman (1977) and Overbury and Bross (1978) have shown that an individual with an extensively damaged visual system is capable of improvement in the analysis of visual information. Moreover, they strongly suggest that specific strategies developed by low vision persons themselves or suggested by the experimenter or teacher, and successfully implemented by these persons, may also be taught to persons who have their vision restored after a long period of absence of visual stimulation.

The results of the above studies have implications for future research at both the experimental and applied level. For example, it would be interesting to note whether improvement of visual performance in a high illumination setting, normally used in experimenter situations, would automatically improve acuity in a low contrast setting. If such was not the case, one would then attempt to show independent improvement of acuity in more natural lighting situations. Another area requiring further investigation is the comparison of static and dynamic visual acuity. Static acuity tests comprise the standard Snellen or Landolt Ring charts which require the subject to identify and/or locate stationary visual targets. Dynamic visual acuity refers to the ability to discriminate an object when there is relative movement between the observer and the object. Burg (1966) found a high degree of correlation between static and dynamic acuity performance which implies that improvement of an individual's static acuity would be closely related to improvement in dynamic acuity. Precise objective measures of dynamic acuity have yet to be specified for low vision persons.

A further area in need of more experimental work relates to limits of acuity for fine details. While gross visually guided behavior has been receiving much attention in the past, delicate visual tasks have been largely ignored. The improvement in vernier alignment as observed by Overbury and Bross shows the possibility for concentration on fine visual tasks in rehabilitation programs. Based on these findings it appears that fine vision is within the capability of the low vision person and is indeed improvable.

Future research should also concentrate on complete testing of visual improvement parameters. One highly desirable type of data would be a comprehansive mapping of the visual field. Not only would one be able to test the degree of visual improvement due to extensive visual work or to certain analytical strategies, but, additionally, one might examine such factors as the locus in the visual field where the stimulus is best resolved, the optimal location for concentration of light, and the optimal contrast of background and stimulus.

Finally, the compensatory physiological or psychological mechanisms which underly any facilitatory changes in the impaired visual system are of great interest. Traditionally, the notion of sensory compensation has been held to apply for cross-modal relationships, i.e., that totally blind persons will show enhanced sensitivity in the auditory and/or tactile modality. There is, however, some evidence available which suggests that such compensation, at least for some sensory tasks, can also occur within the impaired modality. In a series of experiments on monocular deprivation (Bross & Zubek, 1972; Zubek & Bross, 1973; Harper & Bross, 1978) it was shown that monocular occlusion will lead to an increase in temporal acuity as measured by the critical flicker fusion in the non-occluded eye. In discussing these results, the authors favor a physiologically based explanation for this phenomenon. Whether similar effects can occur in impaired visual systems awaits future research, although these findings are suggestive. There is, for example, an increased reliance on peripheral vision which must support, if not replace, the damaged central receptive field. This raises the possibility that the improved visual acuity is due to a stronger receptor-conductor transmission of the remaining fibers. One suggestion for future investigations would be to assess whether weak optic nerve fibers recover to any degree with concentrated visual work. On the other hand, it may be that the cause of visual improvement is not a stronger response from the atrophied receptors and fibers of the retina and the optic nerve, but rather a stronger response from healthy receptors and/or fibers which may have become "lazy" with the onset of impaired vision. Extensive visual work may evoke stronger responses from these fibers which previously had not been pushed to their full capacity. A need also exists to examine the effects of long term visual work as opposed to a twenty minute testing session i.e.,a comparison should be made between results from a one to three hour long testing session. This would enable the researcher to chart the course of improvement, to note if there occurs a plateau effect, or whether, after a certain optimal period, visual performance deteriorates.

Alternatively, the improvement of visual response may be due to a more efficient information processing technique employed by the subject, in that extensive practice with a limited amount of visual information enables the subject to develop strategies of analysis to extract relevant cues from his retinal image. The individual may discover salient features of given retinal images which would provide a basis for the detection, recognition, resolution, and localization of the targets to which they correspond.

In conclusion, then, the basis and direction given to this area by the available experimental data, in conjunction with the above suggestions for future research, make this topic a particularly fruitful field. Moreover, as the primary objective of this research is aimed at applied settings, the rehabilitative therapist should be encouraged to remain in touch with experimental investigations of low vision improvement and to provide active feedback regarding the utility of the research results in a clinical setting.

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LOW VISION IN THE "DOWN UNDER"

By
Dee Quillman*

I was invited by the Royal Guide Dogs for the Blind Associations of Austrialia to go to Australia to help them further develop their low vision assessment procedures. The Royal Guide Dogs is a national mobility agency with the national mobility and guide dog training center in Melbourne. It also has Associatons in six of the seven states in Australia. The Royal Guide Dogs offers both long cane and guide dog training. There are six guide dog instructors and all are based in Melbourne. At present, there are fifteen mobility instructors and five of them are located at the national center. The other ten instructors are based in the six interstate Associations. The Royal Guide Dogs has access to and uses the services of doctors, social workers, counselors, occupational therapists, and other professionals, as needed.

The national training center in Melbourne is a residential facility and has bedrooms for twelve clients. Each room is furnished with shower and wash basin attached. Special dietary needs are catered for and medical and nursing services are available on call. All of the services mentioned are provided at no cost to the client. Either the Royal Guide Dogs bears the cost or it is provided by government funds.

The Royal Guide Dogs wanted me to do the following tasks: 1. to help them develop low vision assessments that are aimed at the total person; 2. to develop visual scanning and visual stimulation techniques; 3. to develop low vision mobility lessons; and 4. to develop forms to provide better communications among those people involved in the delivery of low vision services.

I arrived in Australia on August 12 and began working two days later. I was to spend almost four weeks at the Royal Guide Dog Center with my work terminating on September 7.

My first week in Melbourne was spent mainly getting acquainted with the staff of the Royal Guide Dog Center and vice versa. I did give two talks that week on low viison. The first one consisted of low vision in this country and particularly about low vision at the VAH, Palo Alto. The second talk was spent solely on training techniques. This talk included eccentric viewing, monocular, near vision, and CCTV training.

The second and third weeks consisted of conducting two classes on low vision. The content of each week's work was the same, but there were different people in each class. The week's

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long course consisted of the following items: (1) eye conditions and pathology, (2) assessment of low vision (acuity, field, color, etc.), (3) low vision aids (different types and uses), (4) review of training techniques, (5) CCTV (types and uses), (6) development of low vision mobility lessons, (7) non-optical aids, (8) practical experience with low vision simulators (done with and without optical aids), and environment and mobility characteristics related to the development of low vision mobility lessons. Each person in the course had to do a course project which consisted of designing a low vision assessment and of making three low vision mobility lessons. The lessons were to be for a residential area, a semi-business area, and a business area.

The fourth week was spent compiling a form for use between the Guide Dog staff and the optometrist, and also of making a checklist sheet for the mobility lessons. During that last week I also visited the Royal Victorian Institute for the Blind and the Association for the Blind, both based in Melbourne.

I spent some time at two low vision clinics, both of which are in Melbourne. One is associated with the Victorian College of Optometry which is part of the University of Melbourne. This low vision clinic is the one that is used by the Royal Guide Dog Center. The other low vision clinic is associated with the Association for the Blind and is located at its Kooyong Center. Both clinics provide training with the aids, although the Kooyong clinic has more personnel and space to do so and therefore does more training than is done at the College of Optometry.

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RESEARCH GRANT APPLICATIONS RELATIVE TO THE MANAGEMENT OF SEVERE VISUAL IMPAIRMENT SOUGHT BY THE NATIONAL EYE INSTITUTE

The National Eye Institute is interested in the support of laboratory and clinical research which will have an impact on the management of severe visual impairments. Applications may include scientific investigations directed at improved diagnostic characterization of impairment, disability, or capability; scientific investigations to evaluate new, as well as current, techniques for the management of the disabilities of individuals with severely compromised visual function; and scientific investigations to evaluate new techniques for improving visual, visual-motor, and mobility performance. Studies which have the potential for increasing our knowledge of visual function in health and disease or which involve the application and evaluation of laboratory methodologies and findings in the clinical research settings are particularly desired.

A conventional definition of severe visual impairment is the inability to read ordinary newsprint using both eyes even with glasses. The United States population of individuals with such disability has been estimated as approximately 1.5 million persons (Vision Research - A National Plan: 1978-1982, DHEW Publication NIH 78-1258). The principle causes are the retinal diseases (e.g. macular degeneration, diabetic retinopathy, retinitis pigmentosa, retrolental fibroplasia), glaucoma, cataract, diseases of the optic nerve or muscles, and corneal disorders. In addition, many other pathological conditions, such as multiple sclerosis and stroke, and trauma due to accident,may also have as their end result disabling visual loss short of total blindness.

The National Advisory Eye Council in its recent report Vision Research -

A National Plan identified the need for additional research directed toward objectives in visual rehabilitation. In addition, the workshop on "Research Opportunities Relevant to the Management of Severe Visual Impairment", sponsored by the National Eye Institute in June 1977, focused on recent advances and current needs in the areas of rehabilitation of the low vision individual. Examples of research opportunities identified by the Council and the workshop participants were:

1. Better Diagnosis of Visual-System Impairments and Improved Characterization of Residual Vision. Understanding of the functional losses that result from given types of anomalies at specific loci should permit substantial progress in developing specific measures to aid the visually impaired. Suitable batteries of tests, in addition to routine Snellen acuity and visual field tests, need to be designed and validated to properly assess and measure functional vision of partially-sighted individuals.

2. Development and Evaluation of Special Devices and Techniques to Improve Visual Performance of Patients with Specific Optical or Retinal Irregularities.

   a. Studies are needed to determine the proper balance of brightness, contrast, color, and border contours to give the best possible functional vision in various eye disorders.

   b. There is great need for research directed at improving the use of peripheral retina for patients with damage to the macula, the portion of the retina that normally makes finely-detailed vision possible.

   c. Special contact lenses for patients with highly irregular corneas or with other severe optical distortions require development and evaluation.

   d. Various visual-field enhancers or magnification devices need to be evaluated for specific visual impairments. Contrast, brightness, and other parameters need to be considered in these evaluations. Use of reasonably priced electronic transfer devices, such as units which incorporate closed-circuit television systems, may speed the transition from evaluation to application.

   e. Laser-generated patterns have been used to penetrate some ocular opacities. The parameters of stimulation required to penetrate various ocular opacities (e.g. corneal scars, cataracts, vitreous hemmorrhage) need to be determined.

3. Development and Clinical Trials of Special Devices and Techniques to Improve Mobility and the Performance of Jobs and Skills. Included are sight-substitution systems and various mobility aids. Of particular need is the development of task-oriented tests which are valid and reliable predictors of performance in real life demand situations. Specially constructed simulated environments may prove useful for this purpose.

4. Assessment of Visual Functions in the Infant and Young Child. Visual impairment needs to be detected at the earliest possible time if remedial therapy is to be developed that will have maximal effectiveness in preventing further visual loss during development. Improved detection awaits the availability of normative information about the development of visual capabilities and special techniques may be required for testing infant vision.

The National Eye Institute wishes to encourage further research and development on these as well as other methods and approaches for the prevention, evaluation and management of severe visual impairment. Applications are invited from investigators in all relevant disciplines. Applications including collaboration between professionals involved in the laboratory and clinical sciences are particularly encouraged, as are those from institutions with populations of partially-sighted individuals suitable for research purposes.

National Institutes of Health peer review procedures will be followed for all responses to this announcement. Applicant must use the regular research grant application (formPHS PHS 398) and should type at the top of the face sheet of the application "SUBMITTED IN RESPONSE TO NEI PROGRAM ANNOUNCEMENT RESEARCH RELATIVE TO SEVERE VISUAL IMPAIRMENT". The completed application should be mailed to:

Division of Research Grants
Room 240, Westwood Building
National Institutes of Health
Bethesda, Maryland 20014

where it will then be assigned for consideration and review according to the NIH referral guidelines for research grants. The scientific quality and the technical merit of all applications will be evaluated by a National Institutes of Health Study Section and by the National Advisory Eye Council. Approved applications will compete for available funds with all other approved applications assigned to the National Eye Institute. Potential applicants are encouraged to communicate with National Eye Institute staff early in the process of preparing applications.

Application receipt dates are March 1, July 1, and November 1 of each year. Applications received after any one recipt date are considered and reviewed together with those received by the next receipt date. The earliest possible award date is approximately none months after receipt date.

Inquiries concerning this announcement may be addressed to:

Sensory and Motor Disorders of
Vision and Rehabilitation Program
Scientific Programs Branch
National Eye Institute
National Institutes of Health
Room 6A52, Building 31
Bethesda, Maryland 20014

Telephone: (301) 496-5985

10/16/78

04278-01

Dominican Visual Preference Record (Experimental Edition). JACKSON, R.; BRAUZER, B.; and MERRILL, E.(Comp.) Center for Low Vision Studies, Dominican College, Blauvelt, 10 Western Highway, Orangeburg, N.Y. 10962, 1977.

This instrument is intended to aid in the communication between educators of the visually imapired and low vision specialists or clinicians. DVPR is an attempt to summarize data obtained by teachers on the child's functional vision prior to formal low vision evaluation and prescription of optical aids. The items in the instrument are designed to aid the teacher in observing and recording visual behaviors occuring in regular educational settings, and they suggest further types of observations which teachers might make. DVPR could also be used to assess improvement after trial aids are prescribed.

DVPR is organized into two main sections 1) Conditions for visual functioning. 2) Visual scholastic activities (in accordance with previously determined preferred conditions from Pt. I. Responses are chosen from "Yes", "No" or "NA". There is no attempt to standardize such variables as illumination level or brightness contrast. DVPR is outlined briefly:

Section on personal data: type of education program, eye impairment, parental influence.

Pt. I. Conditions for Visual Function
  A. visual field restriction
  B. color vision restriction
  C. preferred lighting conditions
    1. natural
    2. artificial

Pt.II. Visual Scholastic Activities
  A. various type sizes ranging from 30 point print to 4 point (bold face, italicized, sans sarif) read at distances from 15" to less than 3" away.
  B. pictorial usage
  C. dittoes and mimeos
  D. musical notation
  E. chalkboard viewed at distances of more than 8' to less than 6"
  F. sign utilization
  G. film strips and slides viewed at distances of more than 8' to less than 2'.
  H. motion pictures viewed at distances of more than 8' to less than 2'.
  I. writing skills
  J. object recognition (large and and small stationary and moving objects detected, identified and described indoors at distances ranging from arm's length to 25' and outdoors at distances ranging from arm's length to more than 100'.)
  K. people recognition (identify, acknowledge gestures, recognize facial expressions)
  L. utilization of color in art (identify, select, use)

(M.M.A.)

Preliminaries in a Theory of Practice With Low Vision Children And Youth. JACKSON, Richard Michael, doctoral dissertation, Teachers College, Columbia Univ.
(available through University Microfilms

Advances in opthalmic medicine and optometric technology have disproportionately increased the percentage of legally blind children and youth with potentially useful amounts and qualities of residual vision. The various special education delivery systems that serve these individuals depend, for their effectiveness, upon the availability of a coherent body of knowledge corresponding to the needs of low vision children and youth. A review of the blindness literature concludes that low vision children have educationally-related needs which differ distinctly from the totally blind and that few procedures are acknowledged as addressing such needs in the current and projected populations. Except for recent, sporadic and non-specific recommendations calling for increased utilization of sight, the practical implications of the blindness literature derive primarily a philosophy of sensory compensation. To advance the knowledge base appropriate for competent educational intervention with low vision individuals, this dissertation provides the preliminary steps in the construction of a theory of practice whose target population includes individuals between birth and 21 years of age who have vision as low as light projection and as high as 20/200 in the better eye with best optical correction. Low vision entails the interposition of a sensory barrier between the external visual world and the information-processing capabilities of the developing child. Thus, successful educational intervention must take into account the consequences of visual impairments to the total cognitive process. An information-processing model for the explication of vision-dependent tasks is derived from an eclectic culling of the perceptual psychology literature. The composite model is transformed to reveal the information-processing consequences of various structural anomalies in the eye. By selectively reviewing the literature describing the role of vision in cognitive development, several principles and strategies for age-appropriate intervention with low vision children and youth are advanced. Because this intervention framework addresses the educationally-related needs of low vision individuals as revealed by analysis of the information-processing limitaions derived from the composite model model, this dissertation concludes that a theory of practice with low vision children and youth is warranted and feasible. By regarding the low vision individual as an active obtainer and processor of information, procedures which increase the saliency of visual information in the environment and permit a more efficient integration of successive glimpses into meaningful visual representations are derived. Activities which afford more direct access to the visual world during the formative years are described. These activities positively influence the information-processing capabilities of low vision individuals as they interact with a world where convention favors the efficient use of vision.

(author)

04278-03

Low Vision Lesson Plans for Illinois Visually Handicapped Institute. STALEY, Kay Louise, Orientation and Mobility Program, Western Michigan Univ., Kalamazoo, Mich., April 1978. 67p.

Forty-eight lesson plans of sequential environmental situations for presentation of low vision mobility instruction were developed for IVHI. The 48 lessons are arranged in the following sections: informal evaluation lessons (5) which assess functional vision and mobility skills such as the ability to follow directions, recognize and describe contents of a room, narrate landmarks used for orientation and allow for observation of scanning, pace of travel, and use of non-visual landmarks; lessons grouped by environments such as indoors, ethnic neighborhoods, and urban travel. Each lesson plan includes objectives, outline of the procedure, and considerations or observations.

The lesson plans are preceded by a discussion on low vision instruction which covers such subjects as psychological factors, instructor-client relationship, use of blindfold, information required by the mobility specialist prior to training a client, and skills to be developed in a low vision training program. The following is an example of a lesson plan from the section on informal evaluation of functional vision and mobility:

LESSON #4

Objective:

1. practice of sighted guide skills
2. have the client describe surroundings and make observation of how client relates to environment

Procedure:

1. Discuss the various techniques and allow the client the opportunity to practice
2. Have the client guide the instructor about the building while providing a verbal description of surroundings. Ask the client to provide you with visual landmarks for key areas in the building (e.g. orange wall behind the drinking

fountains, arch windows in the lobby, lights on drink machines, phone booth, "ghost paintings").

3. Does the client have problems with contrasting objects or people?

Considerations:

1. Problems with bumping instructor into objects could be due to forgetting the relationship of guide to instructor, as well as, perception problems or lack of fields.
2. Were the landmarks basically visual, auditory, or tactual? Were the landmarks realistic?
3. Was the verbal description clear and what type of information was provided? (present visual stimuli or memory picture?) A verbal description that was detailed by a low partial may indicate that he functions a great deal on memory information.

(M.M.A.)

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NOTE: Low Vision Literature Pertaining to Education and Rehabilitation: A Keyword Index, compiled and edited by Marianne May, 355 pages, ISBN 0-89128-084-7 has been published by the American Foundation for the Blind, 15 W. 16th St., N.Y., N.Y. 10011.

The index may be ordered (prepaid $7) from AFB.

This index is a title-word index to literature which contributes to the development of the body of knowledge known as "low vision". The index is designed as a selective multi-disciplinary index for use by persons engaged in low vision research or service programs. 938 documents are indexed. The index is divided into three sections: Keyword Index, Low Vision Bibliography, and Author Index.

The following information bases and/or specialized periodicals were monitored and indexed: Index Medicus, DDC (Defense Documentation Center), Psychological Abstracts, Vision Science Index, New Outlook for the Blind, Research Bulletin (AFB), Education of the Visually Handicapped, Fountainhead, Low Vision Abstracts, Long Cane News, Mobility News (England), New Beacon (England), Rehabilitation Literature, and The Visually Handicapped (Germany). While the index contains primarily English language documents, some foreign documents have also been included. The index also includes unpublished works produced in training programs of teacher preparation in the areas of blindness and visual impairment. These documents represent some of the first research attempts to apply visual learning theory and optical aids to distance vision uses of severe visual impairment. Most of the papers have been abstracted in Low Vision Abstracts and the complete document is available through LVA Copy Reference Service.

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